n.-Mar., 19[illegible]

THE INDIAN JOURNAL OF PUBLIC ADMINISTRATION

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TRAINING & REORIENTATION OF CIVIL SERVICE ATTITUDES*

Y. B. Chavan

I AM very happy to welcome you all to this Conference on Training sponsored by the Training Division of the Ministry of Home Affairs and organised by the Indian Institute of Public Administration. As President of the Indian Institute of Public Administration, I have watched with interest and inquisitiveness the diverse activities in which the IIPA engages in the field of Public Administration. I am happy to note that a number of experts in the field of training including Training Coordinators of various Ministries and Departments and State Governments have assembled here for a two-day Conference on training matters.

There cannot be two views on the importance of training for the public services. All jobs in public administration, whether high or low, involve an element of skill and if they are to be performed at optimum efficiency, such skills have to be methodically and systematically cultivated. The employers of public personnel, no less than others, have a right to expect adequate return on the wage bill in terms of efficiency and fulfilment of public purposes.

With the proliferation of Government activity at various levels, such skills are becoming more and more diverse and complicated. To cope with this situation, in many developed countries, a corpus of knowledge is growing on training techniques and considerable research input is being provided to keep it abreast of the needs that are being

*Inaugural Address delivered on February 24, 1969, at the Conference on Training sponsored by the Training Division of the Ministry of Home Affairs and organised by the Indian Institute of Public Administration at New Delhi.

thrown up continually by the swift pace of technological advance. We in India can ill-afford to remain unacquainted with these processes. Even if they are not useful immediately, we should not commit the historical folly of keeping our windows closed to stimulations which, if not today, would certainly be beneficial in days to come.

Apart from imparting job skills, training of public personnel in the Indian setting has another very important aspect. This is the inculcation of right attitudes among the public employees in the context of our Welfare State, which functions through a constitutional and democratic process. I emphasize this point because the bulk of the administrative ethos originated in our country in the colonial period and the yardsticks with which performance could be measured then, are, to a large extent, out of date in the present context. Public functionaries, as a tool of colonial administration, had very limited task to perform and if they were reasonably obedient, impartial and honest, they could meet the requirements of the situation. Today, public servants are instruments of welfare and change; they have to operate in a rapidly developing situation and as they function in a democratic setting, they have to be responsive to public aspirations.

I do not for a moment suggest that concepts or administrative techniques evolved during the colonial era were entirely without purpose. A solicitude for precedent is essential if public decisions are to be consistent and not arbitrary; a certain detachment in behaviour is necessary to keep up an image of impartiality; detailed examination and cross-consultation generates a wide consensus and thoroughness of treatment is, to some extent, time consuming. Yet, the cumulative upshot has been a certain inertia and lack of momentum. You will all agree that if devotion to precedent leads to paralysis in new situations, detachment becomes remoteness, examination turns into procrastination, cross-consultation brings about abdication of responsibility, and thoroughness results in debilitating delay, the objectives of administration, howsoever laudable, are, to a large extent, defeated. As such, the need for fresh thinking on building right attitudes among public personnel is imperative and I believe that in this task, the trainers of today and tomorrow have a very important role to play.

Whether we like it or not, there is today in the country a feeling of inadequacy so far as the public services are concerned. There exists also a widespread belief that the strength of the public personnel has grown at a pace unrelated to their functional utility. Be that as it may the constructive approach now would be to so organise their training and education that each employee is lifted to a high pitch of functiona

utility and the community is compensated by a superior level of services rendered. This is the easiest way of making public servants acceptable.

Yet, in a country where large masses of people are at illiterate and semi-literate levels, mere functional efficiency cannot stir warmth. To the various virtues of civil servants enumerated by theorists from time to time, we have to add one more in our environment, that of humanity. We must realise that for a large number of our rural masses, a little glow of welcome in the eyes of the public official spells the difference between disappointment and exhilaration.

At this place, I might emphasize the need of providing adequate training to our lowest functionaries. In our country, training arrangements for higher echelons of public services have already attained a degree of sophistication and considerable thought is being given to their grooming from time to time. However, it is at the lowest level that the image of the entire administration is either made or marred. The behaviour of a village accountant, a forest guard, a police constable, a gram sewak and a village school teacher does more to shape the attitudes of the masses towards Government than the behavioural patterns at the Union or State headquarters.

I might illustrate this point with an example. We all know that managers of private undertakings can ill-afford to treat their financiers with indifference and rudeness. Whether at high managerial levels or at the bottom most, an attitude of hostility and neglect towards the financiers of the enterprise can be built only at perilous consequences. And yet, when we turn our face to the machinery of government, it often happens that the vast bulk of citizens and taxpayers, who are the financiers of this enterprise, do not receive that respect and solicitation which their status warrants. Instances come to our notice when citizens wait for long hours in government offices, are pushed around from desk to desk and are given a very cold treatment. If there is a clear realisation of their special position as government clients, perhaps, a greater warmth in the relations of the public servants and citizens could be fostered. We have to remember that in a democratic setting, the citizens possess the authority to change the tallest government functionary through the process of vote and with such powers at their command, they cannot possibly accept that the vast infra-structure of civil service forms a group beyond the pale of their command and behest. In the days to come, it might not be enough for a public servant merely to follow the instructions and secure the approval of his superiors; if he leaves the bulk of government clientele dissatisfied and restless, his adequacy would be open to serious doubt.

I have dwelt at some length on these problems merely to state before you how gigantic and delicate are the tasks which face the trainers of public servants in India. The background papers placed before the Conference bring out the quantitative magnitude of these tasks and if all categories of public servants in the Union, States and public enterprises are to be adequately trained, the training resources available in the Government of India, States and in various autonomous institutions will have to be pooled. The financial implications of this venture are also staggering. I am sure the Administrative Reforms Commission are examining all aspects of this problem in detail. Yet, in every programme, a beginning has to be made and we, in the Government of India, have created a Training Division in the Ministry of Home Affairs and have attempted to provide a nucleus from which training advice and assistance should emanate. I am glad that the Division has sponsored this Conference of Training Coordinators of the Government of India and the States and Heads of Training Institutions. This is precisely the type of pooling of thoughts and resources which is necessary to shoulder these burdens.

I am aware that the Indian Institute of Public Administration has already taken up a number of training programmes in executive development at the instance of the Training Division. A number of training programmes are also being conducted by the training institutions of various Ministries and Departments and State Governments as well as institutions like the Administrative Staff College, Hyderabad, and the Institutes of Management at Ahmedabad and Calcutta. The need for training is great and it is necessary that training facilities at all these institutions should be utilized fully and further developed wherever necessary. I shall be keenly awaiting the recommendations of this Conference and hope that your deliberations will be of profit to all those who are engaged in this challenging task of training public personnel. I am happy to inaugurate this Conference.

TRAINING OF CIVIL SERVANTS —THE WIDER PERSPECTIVE*

L. P. Singh

I MUST first correct the impression that I have agreed to address this gathering; I have only consented to talk to you. I had gone through the papers that have been circulated and I wondered if anything useful could be added to what had already been brought out. Yet, as I had been called upon to speak to you, I thought I might take this opportunity to put forward my views on certain aspects of the problem of training.

My considered judgment is that during the last 21 years since India became independent, the most critical deficiency has been on the managerial side. To some extent, the top Civil Service has neglected its management responsibilities. This is particularly regrettable as the Indian administration had a long and unique tradition of attention to management. You find that in the old manuals practically every little detail of management was put down. There was a tradition of choosing every individual for every little job with the utmost care. I have noticed in the old records the meticulous manner in which assessment was made of the weaknesses and strength of an officer's personality. Training was treated as an important function of management and apart from the institutional training that could be provided, great emphasis was laid on attaching young officers to experienced seniors who would give to the young officers generously, from the large reservoir of their experience. The itinerary was worked out with great care and practical training was provided in a number of items, including operations such as land survey and settlement.

The Second World War, to some extent, brought a disruption in this system since the overriding consideration of winning the War superseded activities like training, which though useful in themselves, had not a direct bearing on the War effort. The preoccupation with the immediate objectives resulted in the neglect of the instruments; but this was perhaps inherent in the situation. When Independence came soon after the Second World War, the country was again faced with gigantic

*Concluding Address delivered on February 25, 1969, at the Conference on Training sponsored by the Training Division of the Ministry of Home Affairs and organised by the Indian Institute of Public Administration at New Delhi.

economic, social and security problems and management functions and training continued to be neglected. It is necessary that this missing link with the past should be forged again and adequate attention given to training.

I need not dwell at length on the philosophy behind recruitment to the higher Services in the British days. Under the influence of Macaulay and others who thought like him, the practice developed of recruiting men of high intellectual ability and academic accomplishments at young age through a competitive method. The subjects studied by recruits were of no importance; what mattered was the quality of the mind as shown by academic performance. Naturally, in such a system of recruitment, post-entry training was of great consequence. During the 19th century, excellent training institutions grew at Fort William in Calcutta and later on, at Haileybury in England. In addition, training schedules in detail were framed after an officer joined his new post in the district. Our system of recruitment on general merit followed by a well-planned training stood the test of time, and occasionally one found a distinguished civil servant with a background of Zoology and a passion for Sanskrit poetry, distinguishing himself as an expert in the field of finance and banking. But the point on which I wish to lay stress is that with our system of choosing civil servants systematic training immediately after entry is essential. If you have a civil servant who enters upon his duties without any knowledge of the Constitution of India, the economic and social framework within which he has to function, or who is not aware of our cultural traditions or the cultural conditions in which he has to work, the consequences may be disastrous.

While it is true that there can be no substitute for training on-the-job and some sort of apprenticeship is necessary, the emphasis in India has always been on supplementing apprenticeship with institutional training. In this respect, I feel we have made a major departure from British thinking at least such as it was in the past. When the two All India Services, *viz.*, the I.A.S. and the I.P.S., were constituted under the inspiration of Sardar Patel, good arrangements for their training were devised. The emphasis in the post-Independence training institutions was obviously different; instead of producing good agents of the Empire, the aim was to produce good patriotic Indians who could shoulder the burdens of higher administration.

With the growing professionalism all round, I feel a stage has arrived when civil servants will have to be trained for particular groups of specialisations. The administrative functions have become so difficult and complicated that a generalist while possessing common sense

and understanding of public affairs and management, must have a greater or lesser degree of specialisation in some field or other. I do not believe that everybody is capable of framing a good budget, much less a performance budget, or of managing personnel, or planning the lay-out and equipment of an office, or dealing competently with political, social or economic problems of the country, or managing public enterprises. A greater or lesser degree of specialisation has become necessary. Naturally, specialised training will be in diverse fields and the Training Division of the Home Ministry should devote attention to this complex problem. The initial post-entry training has to be widely conceived; and at the middle stage different groups have to be given specialised training. For topmost administrative jobs at levels where administration becomes something akin to statesmanship, the net has to be cast wide to get from the specialised groups men with conspicuous managerial ability and wide understanding of problems. At this stage one would look for the wider man rather than the specialist. In other words, for the first 5 or 6 years, it is all right for a generalist to have a wide grounding; for the next 15 or 20 years, he should cultivate a measure of specialisation in one of the various fields; thereafter, while some may continue to rise in the specialised lines, others may be considered for wider managerial responsibilities, as far as possible, in not wholly unrelated fields.

On the question of perspective for training, I might suggest that in a rapidly changing technological and social environment, it would, perhaps, not be enough to train a man on the basis of his job requirements at the moment; a forward look is also necessary. The problem is indeed a little complicated: it is to determine the measure in which the job requirements of today and those of tomorrow, and perhaps, the day-after, should be blended.

I might illustrate this point with an example from a recent case. The other day, I had a discussion with senior police officers on the question of training of the higher police. We recognized that the police must be trained for the tasks which it shall have to face in the seventies, when there will be more urbanisation, more industrialisation, more science and technology, a changed pattern of living and a changed system of transport. The road pattern would change and the scheme of lighting, and what is more significant, the pattern and techniques of crime will change. We are already noticing that the style of violence is changing and it is a moot point whether equipping the police with long batons is at all worthwhile when violent mob have a tendency to engage the force from long distances through missiles of all kinds. What I am trying to emphasise is that as in the police, so in other

professions, the job requirements will have a tendency to change rapidly and the planners of training will have to keep pace with this phenomenon.

While it is desirable to keep constant touch with the advances made in training techniques abroad, I might caution against adoption of these in our country without suitable adaptations. At the same time we should not be content with adapted application of current practices in advanced countries; we should know and take into consideration what people are thinking about training in future. I happened to read some years ago the report of the Police Commission in England and I found myself in enthusiastic agreement, not with the majority report, but with the dissenting note of Dr. Goodhart. Dr. Goodhart did not accept the current doctrines and was more exercised about the future. One should not stop after taking into account the current practices and institutional arrangements and techniques in other countries; one should also take note of the ideas that are fermenting, or ideas that are still at a formative stage. We should have a sufficiently sensitive antenna to catch the new ideas that are coming up. I am conscious that I am complicating the task of the Training Division in the Home Ministry, but it is precisely problems of this nature which it will have to grapple with, in order to keep up with changing conditions.

I have noted that in the current thinking, great emphasis is being put on Mid-Career Training. This is all right; but training should be a continuous process and should not come to an end somewhere near half way through a man's career. Even at the senior-most levels, there is need for a freshness of outlook and acquaintance with the latest developments. Indeed I have sometimes felt that older men, with their tendency to fall into a rut or to remain rooted in the past, require the stimulation of training even more than younger people. Of course, the programmes at this level need not be of a long duration and short appreciation courses may suffice.

Then there is the question of the total period in a public servant's career-span which should be devoted to training. When I was working out schemes for establishing an Academy of Public Administration and the creation of a Training Division in the Home Ministry, I had consultations with the Director of Training at the Army Headquarters, and I discovered that when an army officer became a Lt. Colonel or a Colonel after putting an average service of about 17 years, the best among them had already spent some 7 years in various kinds of training. On the civil side, for a proportionate length of service, there might be nothing to show by way of training except the first year or so of initial

post-entry training. I made the flippant remark that such disproportion between training for killing and that for serving the community constructively was hardly defensible. This ratio of 7 to 1 ought to be changed radically by increasing the total period of training in the Civil Service.

I might also suggest a slight modification in nomenclature. Instead of using the word 'training', the wider concept of 'training and education' would be desirable. A focus on training alone would remain confined to the study of job skills and knowledge related to a trainee's immediate functions. In our setting, there is need even for programmes which may not have a direct bearing on one's job, but which are calculated to develop a wider understanding of social and economic problems, and of society and public affairs generally. In this context, self-education programmes have their own place. One of the recommendations of the Second Pay Commission was that the study leave terms should be very considerably liberalised; that there should be no insistence on a man taking study leave only to pursue a subject which is clearly related to his own work; and that he should also be enabled to go to good institutions and spend six months or a year to educate and re-educate himself.

There is another small point which I would like to mention and this is about paying greater attention to imparting managerial and administrative skills to those who enter the public service on the basis of their professional qualifications. The need for training engineers, doctors and other professional groups in managerial skills, rules and regulations, canons of financial propriety, and the tenets of the Constitution, etc., is imperative. Occasionally, blunders are committed by people with professional backgrounds in their administrative functions, in the absence of knowledge of these basic principles. It could happen that an expert inducted to an administrative job may lose his professional competence in the process of administering financial, accounting and personnel matters; or he may perform these duties unsatisfactorily for want of proper training. There can, of course, be exceptions who would feel equally at home in their technical and managerial functions even without formal training; but for the bulk of them, some sort of induction to administration is necessary.

I might in the end invite your attention to an important aspect of personnel policy in the present-day setting. Although the need for specialisation is accepted, the rotation of officers of the All India Services between the Union and the States should not be given up. This system of rotation has stood the test of time, and in the federal set-up which

we have given to ourselves in the Constitution, interchangeability of personnel between the States and the Union is necessary for strengthening the unity of the country. The fact that the All India Service officers have been manning posts both in the Union and the States has, to some extent, helped the political leaders to sustain a spirit of cooperation and understanding between the Centre and the States. It would be desirable to evolve the functional doctrines of personnel management keeping in tact the framework of the All India Services. Perhaps, with a slight modification, a system of rotation will have to be evolved in broadly related fields, so that while the requirements of specialisation are met, the historical compulsions behind the evolution of our administrative structure are not ignored.

PERSONNEL ADMINISTRATION—A MUFFLED CRY FOR CHANGE BY THE ADMINISTRATIVE REFORMS COMMISSION

K. N. Butani

THE ARC Report on Personnel Administration is just out. There is no doubt that in its sweep and content, it will constitute a landmark in the administrative history of this country.

However, the Report does not seem to have aroused as much interest in the general public and the press as reports on some other subjects so far given by the Commission. This is a pity; for the administration which the public gets is, in the ARC's own words, as good or as bad as what its personnel make of it. And what its personnel make of it depends so much on what types of personnel we recruit, how we train them to do the complex jobs of Government today, how we utilize them, how we motivate them to higher levels of performance, how we develop them for higher responsibilities and a host of other things that constitute a Personnel Administration system. And the success or failure of reform in personnel administration, as much as in any other area, depends on the measure of interest that the public and their representatives evince in it.

This article attempts to present, in brief, the more significant aspects of the ARC Report with the hope that it will provoke similar essays by others interested in this subject so that a meaningful debate may take place on the ARC proposals for reform in an area of crucial importance.

Compared to similar documents produced in some other countries, the Report is a short one, covering a little more than two hundred pages of type-script, apart from two notes of dissent and one of supplementation which run to a considerable length, without however, detracting over much from the main theme of the report proper. Even among these parsimonious pages, a generous, perhaps overgenerous, proportion is devoted to subjects, such as conduct, discipline and conditions of service where much of what is said appears banal and repetitive. With what is left, the Commission has tried hard to deliver its message inevitably in an over-concise manner. Consequently, the message fails to ring loud and clear. Yet the fact that there is a message after all, is a measure of the success of its efforts.

What is the message? That the prevalent personnel system is outdated—conceptually as well as structurally—and needs drastic change. It is a hang-over of the past. It served, and served well, the purpose of a colonial administration. The objectives of present-day government are radically different. From a law-and-order and essentially maintenance approach Government today is committed to assuming a leading role in promoting the modernizing process—in the social, economic and political fields—by democratic means, in an environment in which science and technology are inevitably affecting the lives of men more than at any time in the past and where rapid and compulsive changes in science and technology are demanding newer and more complex skills in those who man the Government machine. Yet the Indian personnel system is cast in the old mould. It lacks dynamism and adaptability and is not professional enough. It can scarcely fill the bill of requirements for the performance of diverse functions of contemporary Government. In the words of the Commission: "There is still too great a reliance on the generalist. The technical, scientific and other specialist personnel who have now appeared on the scene are not participating directly in policy formulation. The top posts have not been brought within the reach of all those who have the capacity to hold them. Above all, there is no clearly conceived and articulated policy of personnel management."

This is a substantially correct diagnosis of the malaise that is afflicting the administration today. In fact, these symptoms have been noticed over the last two decades. Literature on public administration is full of references to the inadequacies of the present system. Ministerial pronouncements and professorial comments alike, have laid stress on the inadequacies of generalism in the context of the contemporary tasks of a Government engaged in promoting social, economic, and political change by democratic means in a rapidly changing scientific and technological environment. Yet, it is only now, that in a government document, there is, for the first time, a clear and unequivocal statement that the stage has come to break away from the past. In this lies the most significant contribution of the Personnel Report of the Administrative Reforms Commission. However, one would have wished that the issues involved had been debated and thrashed out much more intensively than the Report seems to have done. For example, who is a generalist and who is a specialist? At what hierarchical levels does a specialist begin to shed or needs to shed, his specific functional attributes and acquire progressively greater managerial/administrative capabilities? In which positions is subject matter competence an overriding requirement as against the 'how' of integrative coordination? Though the Report appears to say that a generalist is one whose

work in Government does not demand any particular professional education/training, this statement is not backed up by the needed elaboration with specific examples of where the difference lies. The same failing can be discerned in the Report's treatment of the specialist. The reader is apparently left to fill in the gaps in the articulation, if not the thinking, of the Commission on this subject. Nevertheless, the Report breaks new ground, which has so far been untraversed by any official document. If followed up in the proper spirit, its recommendations might well transform the structure and ethos of the civil service.

SPECIALIZATION

Specialization appears to be one of the main planks of the reform which the Report envisages. Specializations cannot be just wished into existence. Neither are they an end in themselves. They have to be built up purposefully and methodically and related to the needs of Government. Men have to be spotted, trained, deployed and developed to handle programmes as diverse as family planning and the development of nuclear power. This process is presently hindered by the existing organization of the Civil Service into rigidly organized cadres where at the initial entry level the performance of a candidate at an academic examination of doubtful validity as a talent-testing device, determines once and for all a life-time career; where the most generalist of civil servants have a pre-determined pre-eminence ascribed to them; where the specialists and technologists continue to occupy the side-lines of the administrative hierarchy and where advancement to higher administrative and policy positions is dependent, to a substantial extent, on 'belonging' to the most generalist of the civil service cadres and having put in a number of years' service in that cadre. The rigid cadre system and the formal/informal preference for particular cadres in manning higher posts prohibits the optimum development and utilization of available talent. The Commission finds that, in the manner in which it is operated, the system has perpetuated the generalist tradition with the result that most key positions are manned largely from "generalist" sources, *viz.*, the IAS, the non-technical Class I Central Services, and the Central Secretariat Service. Though the staffing policy does not prohibit the induction of the needed specialists or technical personnel wherever they may occur in Government and outside of it, there is little evidence of a conscious and planned effort at promoting an open-staffing policy and inducting even the best among specialists and professionals into higher administrative positions at the policy making levels of Government. In fact, there seems to be a mental reservation in the way of such an induction. The ruling concept still

is that of generalism which assumes the pre-eminence of the most generalist of cadres and encourages a rapid mobility from one sector of administration to another, thus defeating all attempts at building up specialized competences. Administration has become complex and is becoming more and more complex with each passing day and unless specialization becomes a living tenet, effective administration will remain an idle aspiration. The Commission wants to make this aspiration come true and towards this end it makes certain practical proposals which are basically intended to break the present barriers and inhibitions.

The need to induct specialists and technical personnel in Government is often conceded even by the strongest supporters of the existing system. Where they differ is the role that should be assigned to the specialists so inducted. They would have them perform an advisory role and not be integrated into the decision-making hierarchy. For example, they would concede that where specialist advice is needed for policy formulation, a specialist needs to be brought in and, if need be, even paid whatever his professional standing may command in the market; but they would not fit him into a hierarchical level, say that of a Joint Secretary. The argument against assigning the specialist a hierarchical position usually begins by stating that the specialist may not be adept in the handling of men and matters involved in relationships with other concerned departments/agencies, etc., or with those at higher levels in the hierarchy. Sometimes, however, when specific instances are cited of specialists who would easily fill the bill of requirements even in this regard, the argument gets down to the need for the preservation of existing rights and aspirations of the generalists of a particular cadre. It is stated that the induction of a specialist into a hierarchical position would affect the morale of those who have already been recruited into the generalist cadre and who, in the normal course, aspire to occupy such positions of administrative/policy making responsibilities. The induction of the specialist would impair the existing rate of fulfilment of these aspirations and thus impair morale. Therefore, the specialist must continue to be assigned an advisory role and a generalist must also be there if need be at the same horizontal level in the hierarchy for various reasons, including one of preserving the morale of the generalists. What about the waste, the frustration and delay involved in operating through a parallel hierarchy? It is at this point that one needs to ask a brutal question; and that is whether the Personnel System is intended for the fulfilment of the objectives of Government or the aspirations of its employees. The morale of employees is, of course, important and their motivation vital. But can that be the major objective of a Personnel System ? The major objective

has to be the efficient performance of the tasks of Government; and where this demands the induction of specialists into the hierarchy, the welfare and morale of other employees come thereafter and must be subservient to the major objective. Of course, in the interim arrangements, when the reform proposals are being implemented, there are bound to be some difficulties arising from adjustment of the old to the new. But these are not insurmountable; and given the will and sincerity of purpose the transition can certainly be made less painful for those most affected by the proposed changes.

Credit is due to the Commission for having grappled with this generalist-specialist situation. While it makes quite clear that generalists have an important place in the administration, it makes equally clear the need for ending the existing practice which has tended to exclude specialists from higher administrative policy positions in Government. In this context, the Commission has stated:

> "The generalist has his place, and an important one at that, in the scheme of things; but so has the specialist, the scientist, and the technologist. In a growing democracy, committed to rapid socio-economic development, the administration has to be good no less than it has to be effective; if a good administration is imperative for the happiness and welfare of the people, an effective administration is a prerequisite for the strength and prosperity of the country. This twin purpose needs the devoted services of the specialist no less than those of the generalist. The problem really is one of harnessing their talents and capabilities through a purposive symbiosis in the larger interest of the common good, and of ending a practice which has tended to exclude the one in favour of the other, with its concomitant milieu of mutual sullen antipathy supercilious snobbery."

FUNCTIONAL APPROACH TO STAFFING

The Commission proceeds to give a practical solution to this undesirable situation. It has analysed in a fairly scientific manner the need of the higher administration today. This examination has been limited to the Central Government. Such a limitation was perhaps deliberately self-imposed, because to include the States within the canvas might have needlessly enlarged the issues. It says, however, that the principles it has sought to establish should be equally applicable to the States. In its attempt to suggest a rational scheme of staffing of administrative and policy positions in the Secretariat, the Commission has consciously enunciated a new philosophy: the approach to staffing

of Secretariat posts has to be functional. If the post in view requires a particular functional knowledge, whether of industry, agriculture, taxation, economics, law and order, or what have you, the post should be filled by the corresponding functional cadre or service or group or whatever name you give it. Thus, if an objective analysis of the duties and responsibilities attached to the post of a Joint Secretary in, say, the Union Department of Agriculture, indicates that professional knowledge of Agriculture is the predominant requirement, then that post will need to be filled by a specialist in agriculture who will have been groomed for it early enough in his functional career to assume administrative responsibilities also.

A functional service could be technical or non-technical. In other words, the personnel of a functional service could be either specialists in the sense of needing a particular qualification for entry into Government, or generalists in the sense of needing only a general education. In the enunciation of this principle, the Commission seems to make a clean break from the prevalent concept of generalism. It is the knowledge of the function that is relevant and not just the possession of what is often loosely described as general administrative skill that should be the paramount consideration in the manning of positions in Government. The Commission would apply this principle to all levels in the Secretariat from Under Secretary to that of Secretary, where the knowledge of a particular function is the predominant requirement.

Each post has to be examined with reference to its work-content in terms of subject-matter competence and related to the service, or the cadre, which can legitimately and effectively fill the post. In other words, the job has to be subjected to a scientific analysis and manned in relation to its requirements in terms of skills, training and experience. Thus, in the manning of posts the Commission has emphasized the job-analysis approach without specifically using the word "job-analysis". This is another wholesome break with the past.

The Report says further that there will be a number of posts at headquarters which are of such a nature that no one particular service can claim to be uniquely fitted to hold it. To these posts men should be brought in on the basis of a free and fair competition, from all the functional cadres. No particular cadre will, *ab initio* be constituted on the assumption that it alone will provide personnel for the top administration/policy positions on the basis of a superiority established at an academic examination at the entry point in service.

Such men will work in one of eight specializations; Economic Administration, Industrial Administration, Agricultural and Rural Development Administration, Social and Education Administration, Personnel Administration, Finance Administration, Defence Administration and Internal Security and Planning.

Each function is important; none can be slighted at the expense of another. The success of government depends on the successful performance of its personnel in each of these functions. The functions themselves have become greatly diversified, demanding the development and exploitation of different and diverse human skills. The Report says that wherever the number of personnel involved in a function is viable appropriate functional Services should be constituted. Thus, the concept of a Service for each identifiable function is at the base of the proposed reform. Each functional Service will be formed and developed to perform its allotted function effectively. Each functional Service will also contribute to areas which cannot be ascribed to any particular function. This, again, is a significant departure from current practice. This will provide an opportunity to select the best from all sources. It will also enable all Services to develop themselves to the utmost of their capacity. With the functional approach to staffing, the utility of a general-purpose Service like the IAS will obviously diminish and the Commission makes this point very clear. In its present design, this Service is closely patterned on the ICS of the olden days. Under the impact of the kaleidoscopic changes which have taken place in the post-Independence era, the original concept of the role of the IAS will need readjustment. The Report, in fact, suggests that the IAS should have only one related range of functions: Land Revenue Administration, exercise of magisterial functions and regulatory work in the States in the fields other than those looked after by officers of other functional Services.

MIDDLE-LEVEL AND TOP POSITIONS

According to the scheme presented by the ARC, the functional Services will be the reservoir from which the Government will draw its personnel for middle level administrative/policy positions. Entry into these positions will be thrown open to all sectors of civil service—technical as well as non-technical. The selection at this level will be by a competitive testing of skills and aptitudes supplemented by an objective evaluation of the actual performance in the functional area of initial allotment. This mid-career "proving" of capabilities is still another significant departure recommended by the ARC from the existing practice, inasmuch as that advancement of middle/higher administrative/

policy positions is not dependent on seniority or membership of a particular cadre, but on a competitive manifestation of skills and capabilities. After this initial selection by an appropriately designed competitive test, which will have to be very different from the academic entry examination, those selected for middle level administrative/policy positions will be put through an intensive training programme, before being assigned to such middle-level positions. With entry into these positions thrown open to all sectors of the civil service, those who have the capacity to develop and improve continuously will have ample opportunities for further development and progress.

Out of such mingling of talent will come the senior management. After about six years of stay in middle administrative/policy positions, a fresh selection based on an objective evaluation of performance will be made for positions of Joint Secretary (and equivalent) and above. Those who do not make the grade at this level of selection, or those who have completed 6 years and are not within the ambit of selection for senior administrative/policy posts, will not continue in those middle level administrative/policy positions, but go back to the functional area from which they came, to make room for the induction of fresh blood from those functional areas. Such amongst those who go back as did not fall within the ambit of selection will be eligible for selection for senior administrative posts at the appropriate time even if they are back in their parent functional cadre. This policy will, the Report hopes, effectively open the door to the top to all worthy aspirants from all sectors of the civil service.

UNIFIED GRADING STRUCTURE, INCREASED PROMOTIONAL PROSPECTS AND TRAINING

The Report makes many other wholesome recommendations. It finds that the present pay structure, specially of the higher services, is too protective and anachronistic and does not provide sufficient impetus for continuous good performance. The existing pay structure leans heavily in favour of the IAS where a long scale of pay automatically* confers certain claims to higher positions which are partly on that account, denied to others who may otherwise be equally suited. The multiplicity of scales also hinders movement across cadre barriers. To remedy these defects, the ARC suggests a unified grading structure in which each grade will represent comparable levels of responsibility in all the functional cadres. Thus it will be the post that will carry

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**Personnel Administration—The Need for Change, Report of the Conference held in the IIPA during March 5-9, 1968*, New Delhi, Indian Institute of Public Administration, 1968, pp. 23-25.

:ertain scale of pay, and not the man who occupies it. This is another ;nificant departure from current practice.

There is also to be a greater measure of promotion to the Class I /el (All-India and Central) from the lower levels. A special procedure .s been proposed to pull out talented younger men early enough in eir careers to the higher levels. A further measure suggested is to low the serving personnel to take the open competition for the Class I rvices with relaxed age limits up to 35.

The Report realizes that its scheme of developing specialized mpetence will need special training facilities. In an excellent chapter spells out the training needs at several stages in an average civil rvice career. Incidentally, it says that even the senior management eds orientation training.

THE TOTAL PICTURE

Any report has to be judged by its total effect. Does the Personnel :port conjure a total coherent picture? Perhaps for the lay reader ere may be some difficulty in discerning an overall design in the scheme the Report. For this the over-concise treatment given to important iestions is entirely to blame. However, for the professional student public administration and for the practising administrator there)uld be no difficulty in discerning such a design. In brief, it is this: the changed circumstances and due to the transformation that has ken place in the nature and functions of Government, a general-ırpose cadre like the IAS is inadequate for effective administration. this context, there could be no such species as a generalist to the rvice born. Each functionary must *ab initio* specialise within a ıgle function. Most shall stay in that function and try to do it well. ıose who show general managerial competence, shall be drawn out)m the functional Services and trained for middle level administrative/ licy posts for deployment in related areas of specialization. Even r higher levels the need for specialization will be kept upper most cept that the degree of specialization will need to be broader. The ecialist who has so far been kept on the sidelines in the administrative t-up, shall henceforth be integrated into the hierarchy. There will several related specializations at the middle level but the number of ecializations will decrease at the senior management level and the ːa of deployment will broaden out. The true generalist whose func-ıns will be integrative coordination will emerge at this stage from the /eral functional cadres. The top executive, that is, the Secretary to : Government, shall be chosen from among the best in the functional rvices and from among those who have moved out of the functions

into the several mid-career specializations. Even here the specific need of the post shall be the major consideration. Through all this web of thinking runs a single strand, namely, that each job should get the man who is best fitted to hold it. This is indeed a revolutionary change proposed in the current situation.

INADEQUACIES AND GAPS

It is not too difficult to find various lacunae in the Report. Take, for example, the number of specializations indicated at the middle management level. Not less than eight specializations have been indicated for middle-level administrators. Into these specializations will come not only the generalist but the appropriate specialist. One can perhaps take up issues with the Commission on the actual number and description of specializations; but on the need for specialization itself there could be very little room for dispute. For example, whether we have reached a stage of complexity where we would need two separate specializations in the economic and industrial fields can be debated. Similarly, whether planning by itself needs specialized administrators is a matter of some doubt. Planning cannot proceed on theoretical lines and precepts. The planner must necessarily have a grounding in the area which he is planning for. The Report apparently assumes that a generalist (or even a specialist) who has moved over to planning and who has specialized in its techniques can switch his talents with facility from electronics to agriculture and from petroleum to propaganda. Perhaps the Report does not envisage this kind of a versatility. If this is so, it has not taken pains to clarify the position. However, in deciding these areas of specializations the ARC has indicated an excellent pattern which evidently is not intended to be inflexible but only a starting point. The number of specializations may have to be designed around the results of the detailed analysis of job contents at all levels.

Then the senior management level of Joint Secretary and above. Here again, one gets the impression that the Commission favours specialization, but the fields of specialization would be much broader than in the middle management level. What these fields are, has not been spelt out. This is not to say that the argument is not sound enough. The bane of administration, specially in the key sectors of policy, has been an all too rapid movement of personnel from one sector to an entirely unrelated sector, often in quest of promotion, leading to the sorry spectacle of good and diligent men finding themselves unequal to their tasks. Though the Report has not indicated the broad areas in which the Government's senior management should be deployed, with the detailed analysis that the Report has made of specialization at

the middle management level, it should not be difficult to mark out broader areas of specialization at the senior-management level. However, this ought to have been done by the Commission itself and indicated in the Report.

Secondly, there are patent gaps in the scheme of specialization at the middle management level of Deputy Secretary. The Report says that those who move to the specializations at headquarters from the functional Services, will stay for six years, excluding training, so that full benefit can be reaped out of their growing expertise. What happens when they return to their parent cadres? A question may be asked whether the expertise acquired in the specialization will not be wasted on retrun to the necessarily functional parent cadre. The Report does not answer this point. Perhaps the answer will lie in the fact that the increasing activities of Government will enable the middle management specialist to use his specialized knowledge in his own functional area of administration. Even otherwise, the diversification which the scheme affords, will do good to the individual himself and consequently to the function to which he belongs.

Thirdly, an extreme question may also be asked: Is it not possible to develop these specializations within one cadre, say, the IAS itself? The Commission appears to assume that this point will not arise. Even here the answer could well be that we have lived too long under the hegemony of one Service. It is neither good for that Service nor for the Services as a whole nor for the administration in general that this hegemony should continue. Government is interested in getting the best from all sources and the best cannot be assumed to have clustered into the IAS on the basis of an academic examination taken very early at the entry point where the marginal difference between getting into the IAS or the next-preferred service may well have depended on the capacity of a candidate to remember the names of all the wives of Henry the Eighth. And in any case, the best amongst the University graduates are not entering the IAS. The professions—notably amongst them being Engineering and Medical—are taking their share; and some of these enter the public service later. Why must one proceed on the assumption of an *ab initio* pre-eminence of one cadre—the most generalist amongst all—and then proceed to consider how best it could be re-organized to make for the specialization that is called for in modern government. The question that should really concern one most is not how best to re-organize one particular service or to convert the generalists into specialists but how to get the best from all sources and how to convert the specialists—with whom we have inevitably to live—into generalists, progressively, as they move up the hierarchical ladder.

We have to begin with specialization in the functional areas of administration, because there are so many areas of decision-making in respect of which even at the higher administrative/policy positions a substantive functional knowledge and experience is indispensable. And this cannot be acquired by a "generalist" initially recruited as such even if he, by accident, happens to possess technical academic qualifications.

DISSENTING NOTES

The dissenting notes hold much interest in themselves. There are two of them with one more called a note of supplementation. The Kamath note does not question the main thesis of the Report at all. The Shanker note of supplementation accepts the principle of specialization and induction of specialists in the higher administration but introduces a word of caution and advises that these measures should not be overdone. It would, however, appear that the stage for caution is past and what is required is determined action.

The Shanker note of supplementation also argues against the officers of the All-India Services being put to a mid-career competitive selection for middle level administrative posts. The reference to All-India Services is really to only one amongst them, *viz.*, the IAS. Why this reluctance to subject the IAS to a process of "proving" their capabilities in a competitive mid-career selection process? It is seriously suggested that an academic test taken years back at the entry point in service is an adequate measure of a man's capability all through his career? The argument goes that when once the IAS entrants have already established their superiority over others at the entry point, there should really be no need to subject them to another mid-career test, as if by even taking a test in the company of others, the superior character of the IAS will get contaminated. Why not let them re-establish their superiority at a mid-career selection for a different kind of responsibility and by a different kind of test? If they are, *ab initio*, so superior, they will undoubtedly score over the others in the mid-career selection in even larger numbers. And if not, the immutability of the performance at an academic entry examination will have been put to question? This hesitation to expose the IAS to a mid-career competitive selection for middle/higher administrative posts, not un-shared by officers of the IAS themselves, is quite incomprehensible.

The Singh note raises some fundamental issues. It rightly inweighs against the existing pattern of staffing of the headquarters where, at least at the middle level, men lacking in field experience constitute a sizable proportion. It fears that the scheme recommended by the

Report may perpetuate and even aggravate this state of affairs. The note, however, seems to err by identifying field experience too narrowly with the experience acquired by administering in the States. It does not appear to give the importance that is due to other and diverse executive experiences which exist in Government today and which are equally relevant to the needs of higher administrative/policy positions. Field experience would include all experience of handling executive responsibility and not necessarily only the experience required by the IAS in the districts*; the approach indicated by the ARC fully takes note of this in the sense that no one is considered for selection into the non-functional middle level administrative positions, who has not done a spell of work of about 8-12 years in his own functional area. This work in his own functional area would hardly be desk-work. After all, there are a number of central and state services, who also handle executive responsibilities even in rural areas. This point has been brought out in the Nagarkatti Study Team Report. Thus, it is to be presumed that the reference to "desk-workers" is not a reference to *all* the service cadres other than the IAS.

The very forth-right statement in this minute of dissent presumably made to support the argument against "desk-workers", that "it is not unoften that the notings at the Under Secretary level prevail right to the top" is, to say the least, a very simplified version of reality and a sad, but patiently uninformed comment on the functioning of senior management. It is so far removed from reality that any comment would be superfluous.

However, even the Singh note of dissent concedes that "with the growing complexity of the administration we will require specialists in larger numbers than generalists. It is, therefore, but natural that in course of time specialists should come to occupy many of the positions which have uptill now occupied by 'generalists'. Consequently, the scope for the IAS is bound to be reduced." However, the Singh note suggests that the functional area carved out for the IAS by the ARC is too restrictive and needs to be enlarged.

STUDY TEAMS

The Report of the ARC throughout gives credit to several Study Teams who did exploratory work on which the final Report is at least

*With the phenomenal increase in the strength of the IAS cadre from 803 in 1948 to 2,983 in 1968 and the number of districts (Excluding Union Territories) being around *300 and odd*, it is impossible to visualize how IAS officers on an average can ever have more than some months stint in the district. (*See* also Shri P. K. Dave, "The Collector Today and Tomorrow", *Indian Journal of Public Administration*, July-September, 1965 and Dr. David C. Potter's Report on *Training of IAS Officers in the States* prepared for the CRC.)

partly based. However, direct support appears to have been drawn only from one Study Team and that too only in the Shankar note of supplementation. There is a quotation *in extenso* which states that the generalist-specialist controversy is barren. It is unfortunate that the main Report has not rebutted this argument by quoting the conclusions arrived at by other Study Teams. In fact, had this controversy been barren, there would have been no justification for the detailed scheme of specialization and specialist induction which the Report is at pains to sketch which even the Shanker note of supplementation supports. The other Study Teams have in fact held the contrary view. The controversy between the generalist and the specialist is by no means barren. It carries the seeds of dissension and will bear the grapes of wrath. For example, the Deshmukh Study Team on the Machinery of Government has made a very penetrating analysis of the existing situation, particularly the prevailing concept of generalism and its conclusions ought to have been quoted to give the correct perspective. In listing the shortcomings of the existing system this Study Team included the present division of work into 2 types: Type A which is handled wholly in the Secretariat, and Type B through non-Secretariat agencies. The Study Team described the Type B situation, thus:

> "In the Type B situation, there are all the familiar defects of paralleled hierarchies. The secretariat laboriously examines every matter referred to it by the non-secretariat organisation, even though it may have gone through much the same kind of examination there. While this process does help to promote exactitude in the compliance of rules, it fails in two respects. Overall evaluations of programmes and activities are seldom carried out, the emphasis being on itemised check. And since secretariat personnel are generalists and usually unacquainted with the field conditions encountered by the non-secretariat agency, even this itemised check is often based on an inadequate appreciation of problems. This results too often in wrong decisions, delays and frustration. Since non-secretariat organisations are usually manned by specialists or technical personnel, one of the outcomes of this Type B situation is that it tends to range specialists and generalists in opposite camps. Theoretically, responsibility is shared between the subject joint secretary in such a situation and the head of the non-secretariat organisation, but in fact all responsibility is often dumped on the latter, the former being answerable for practically nothing. Responsibility and authority are thus not matched with each other at either level."

While delineating their approach to re-organization of the machinery of Government, the Deshmukh Study Team indicated a minimum

programme of reform of which the relevant recommendation (the fourth) is reproduced below:

> "The monopoly of generalism should be broken. Specialisations should be gradually developed amongst generalists, and specialists and technical personnel freely inducted into secretariat wings. They should, as far as possible, be fitted into integrated hierarchies within wings."

The same Study Team while commenting on the existing personnel practices had this to say about senior management:

> "Such management of senior management as exists operates within the frame-work of current personnel policies. The weaknesses and limitations of the latter thus become those of the former. Of special relevance are the following:
>
> There are to begin with limitations flowing out of the dominant position of "generalism". First, selection into senior management is heavily from the generalist cadres, particularly in secretariat posts. The following table shows the extent of representation of the generalist cadres at the various levels within senior management.

	generalists	*others*
Secretaries	33	4
Special Secretaries	3	1
Additional Secretaries	18	7
Joint Secretaries	115	28
Advisers and others	9	29
Heads of non-secretariat organizations	13	30
Total:	191	99

> It will be seen that promising sources other than the generalist cadres have remained largely untapped in the first four categories. The heavy reliance on the generalist source deprives senior management of the depth which might come from a larger admixture of persons possessing basic specialisations. It can surely not be the case that specialists are all incapable of displaying the skills and broad administrative vision necessary for senior management. Whether as a result of reform on the basis of this report or otherwise, the future holds an increasingly important place for specialists and the existing restrictions imposed by concepts of generalism on entry into senior management will consequently need to be relaxed.

Next, because of generalism the mistaken idea persists that every senior administrator is good enough to handle almost any senior management assignment. While happily this idea does not prevail in the case of the more important appointments, cases do occur of able officers being given jobs they are not particularly suited for and do not much like. Such officers cannot give of their best. The waste involved in 'mis-fit' appointments of this kind is something the country can *ill*-afford, considering the shortage of good senior managers.

The same idea is probably at the root of the phenomenon of excessive mobility. Senior personnel are often not kept at their posts for long enough. Often senior personnel themselves want changes to more prestigious assignment and this adds to the problem. Even when senior personnel remain in the same ministry for a number of years, the subjects allotted to them keep changing. We understand, for instance, that in a particular large ministry the practice has obtained for about two years of joint secretaries proceeding on leave one after another in order to accommodate a spare officer at that level; during all this period, needless to say, there have been frequent changes in the charge of joint secretaries as a consequence. Excessive mobility with its accompaniment of short tenures prevents senior managers from getting a full grasp of their work and hence from making the impact they might otherwise be capable of. It also tends to produce attitudes of superficiality in work; officers are reluctant to put in their best when they are not sure of long enough tenures.

These are then weaknesses in the cadre system which feeds senior management. The prevailing system has its origin in the arrangement under British rule when the ICS cadre was there specifically for senior management whether in the district or in the province or at the Centre. All other cadres had ancillary or subordinate roles. The pattern of experience of ICS officers was such that they were able to fit into the then senior management posts at the Centre adequatey. The position of IAS officers today is much the same as that of their ICS forerunners in regard to their experience pattern, and they consequently form as good a source for senior management manning. But this is no longer the only source, since over the years several central services have come to contribute personnel for senior management in significant numbers. Also, the diversification of governmental functions that has taken place in independent India calls for more rather than less intake from other sources, particularly from the specialist cadres. These other sources possess promising material, but do not, unlike the IAS,

have the advantage of experience patterns that help to develop skills and qualities required for senior management. Personnel from the accounts services and the Central Secretariat Service almost totally lack, in particular, the executive experience necessary for developing truly adequate senior managers. This introduces a weakness, and there is not much in the management of senior management to neutralise it, either through pre-entry training or through post-entry programmes for the development of individuals. The change from unicadre to multi-cadre manning of senior management posts thus has implications which seem to have been insufficiently attended to so far. Instead there has been an almost unseemly struggle for bigger shares in senior management posts for the various cadres, creating an impression that the guiding consideration in the minds of all concerned is the good of this or that cadre rather than that of senior management itself."

Similarly, speaking of deployment of senior administrators, the Deshmukh Study Team had this to say on the existing concept of "generalism":

"The correct deployment of senior administrators is the next most important function in the management of senior management. The principle of 'generalism' casts a long shadow here and tends to act as a force towards unplanned deployment, because to the devotee of generalism it does not much matter whether a person has an aptitude or background for a certain post or not. He is also not seriously enough concerned if individuals stay too short a time in a post or too long. It is our impression, in other words, that the deployment of senior administrators has not had the element of planning that is required to maximize the effectiveness of senior management."

And, lastly, the Deshmukh Study Team has observed that:

"If senior management is to have the best possible talent, there should obviously be no barriers to obtaining it from any possible source, within the administration or outside. There should, in other words, be more plurality in senior management than now. We should like to make the following points in this connection:

(*a*) There should be systematic talent hunting for entry into senior management, within the traditional source of the IAS, in the various central services and, most important, amongst the technical and scientific employees of the Government. Those market out as eminently promising should have individually

tailored programmes of personal development to fit them for senior management."

The ARC Report fails to back up some of its conclusions by the needed data which is provided by the Study Teams Reports themselves, an example of which is the table included in the Deshmukh Study Team Report reproduced earlier at p. 25.

The Report is worded very rightly in favour of the specialist. Published statements and expressions of sympathy notwithstanding, the specialist is still the Cinderella among the services. It would be surprising to note that as things stand at present, an able member of the generalist Central Secretariat Service has a better career value in terms of prestige and emoluments than an equally able member of, say, the Central Engineering Service. If these facts had been highlighted, the plea which the Report makes for a better deal to the specialist could have carried greater conviction. And this better deal to the specialist is needed not for the benefit of the specialist himself but for the better performance of the tasks of Government.

Despite these defects, the ARC Report is a landmark in the history of administrative reform. It has got its sights correctly. It points to a new philosophy which is commended for acceptance. It cries out for change, but the cry is somewhat muffled by some of the inadequacies which, it is to be hoped, are only inadvertent. It is further to be hoped that even this muffled cry will not end up by becoming muted.

IMPLEMENTATION

The fear that nothing substantial may come out of the ARC's Personnel Report arises from two factors. One is the seeming apathy of the Press, the public and its leaders to the fundamental character of the reform adumberated by the ARC. This may be due to a lack of true comprehension of the existing system, its inadequacies, the manner in which it operates to perpetuate itself, and also on how changes proposed by the ARC are to be translated into action.

The second source of danger is the process of consideration and implementation of the ARC's recommendations in general, and it's recommendation fuı personnel reform in particular. The ARC's personnel reform aims at making a drastic change in the existing order. Who will consider these recommendations, distil their essence and make specific proposals for consideration at the highest level for eventual

decision-making on acceptance or rejection? The answer is: those who will be affected most by the ARC's proposals—the generalists who constitute the middle and higher-middle levels of the Establishment today. How can this happen? Has any Establishment been known to vote for the curtailment of its own ascendency? Unless a deliberate and conscious attempt is made to install a suitable machinery for the consideration and implementation of the ARC's proposals on personnel reform, they are doomed to get lost in their processing through these levels in the Establishment.

Even today, when reform of the Personnel System is in the air and pronouncements of egalitarian principles plenty, the Establishment, in inviting recommendations for the manning of posts of Joint Secretaries in the Central Government, from various cadre-controlling authorities, have indicated that only such officers amongst the non-IAS cadres as have completed 20 years of service should be considered while the corresponding eligibility limit for the IAS has been placed at 18 years. No officer of a non-IAS cadre, no matter how deserving otherwise, will even be considered for appointment as Joint Secretary except along with officers of the IAS, 2 years junior to him by virtue of the year in which they took the initial entry examination. Why? Such a weightage did not exist even in the days of the ICS except in early years when the 2-year probationary period was not included in their case as against officers of other services, while reckoning the total length of service (or the year allotment). Later, when their probationary period actually began to be reckoned, this two year weightage in favour of the ICS seems to have become inoperative. Why then has it been revived in favour of the IAS?

What then can be done to ensure an unbiased and speedy consideration of these proposals? The general public must articulate its concern by organizing Citizen's Committees to debate, and watch the implementation of the reform proposals. The leaders of the people drawn from all shades of public opinion could similarly constitute informal/formal Committees/Groups to generate the needed impetus for a speedy consideration of these proposals by Government; professional bodies should organize debates to thrash out the pros and cons of the reform proposals and articulate their viewpoints effectively—the IIPA, IAMR, ASC, and Universities could take a lead in organizing such debates; and in Government itself a machinery should be installed whereby these proposals receive objective and unbiased consideration at the hands of professionals and others who truly comprehend the implications of a personnel system on total governmental functioning and who are capable of bringing to bear on the important issues raised

by the Commission a truly unbiased viewpoint without any concern for the maintenance of the rights and privileges of any particular group(s) of personnel or for sentimental concessions to the less privileged. And this could perhaps be done in a new Personnel Department recommended by the ARC in its report on the Machinery of Government. The proposed Personnel Department has been recommended for location directly under the Cabinet Secretary, outside the sphere of responsibility of any Ministry which manages any particular cadre. In addition, the pattern of manning of this new Department will be important. The ARC makes this clear.

> "The staffing of the Personnel Department is of crucial importance. The Secretary, who will head this Department, should be specially chosen and will need to have done a good deal of serious thinking on the personnel structure and its problems. His deputies and assistants have to be representative of all Services and groups in order to create the necessary confidence. Lastly, there will be, to start within the need for expert assistance for its immediate tasks, because we feel that, techniques like analysis and evaluation have not so far been developed within the Civil Service."

The Deshmukh Study Team had also emphasized the importance of the manning of the Personnel Department. In their words:

> "A large number of functions which this department would be called upon to perform are such as would require a generous measures of expertise in those who are charged with their performance. It is, therefore, necessary that it should be expert-oriented to the maximum extent possible. For instance, the Policy formulation division should have staff of the category of analysts, well trained in various analytical and research techniques. Similarly, the divisions in the Development Wing and the Inspection Division should have staff possessing training and experience of a specialised character. It is envisaged that the existing staff in the Ministries of Home Affairs and Finance with experience of handling personnel management problems should be able to function effectively in a number of positions in the department. It is, however, important that for other positions, persons with the types of specialised skill and expertise needed for evolving and implementing sophisticated personnel management policies should be inducted into the department, post-entry training being also arranged wherever necessary."

CONCLUSION

The foregoing discussion spells out the main merits and demerits of the ARC report. The merit is of crucial significance: the evolution of a new philosophy of personnel administration based on a clear and unequivocal recognition of the dire need to induct the needed specialized and technical manpower into administrative/policy levels in Government. The demerits are only of a peripheral character; the failure to fill in the details and answer the sceptics whose stances could easily have been visualised. If the cry for change seems muffled, it is perhaps because the ARC appears to have been at pains to reconcile the various viewpoints—many severely in conflict—of the various Study Teams. All the same, the Personnel Report is a seminal contribution to the strengthening of administration for the fulfilment of tasks undertaken by Government. If we can be persuaded to comprehend its significance and implement the recommendations in the proper spirit, a lot may still come out of the existing administrative machinery. Such opportunities for taking an overview of the Government machine and tuning it for the difficult tasks that lie ahead occur perhaps once in a generation or so. The current opportunity, coming as it does at a critical juncture, is in a way of historic significance. Can we afford to lose this opportunity?

PERSONNEL ADMINISTRATION —THE NEED FOR REALISM

M. K. Chaturvedi

THE recent report on Personnel Administration of the Administrative Reforms Commission is an important document. The Commission has proposed many far-reaching changes in the personnel structure and procedures in the Government. However, this attempt at personnel reforms is largely disjointed and lacks realism and consistency in several respects. Three separate notes on the Report have been attached by Shri H. V. Kamath, Shri V. Shankar and Shri T. N. Singh. No previous Report of the Commission had so many separate notes by the members and this is indicative of the wide divergence of views in the Commission on almost all major recommendations.

Notwithstanding the substantial differences that have arisen among the members of the Commission on the recommendations contained in this report, its crucial nature is beyond dispute because sweeping changes in the personnel structure at higher levels have been advocated. Before the recommendations are analysed in detail, it might be worthwhile to pinpoint the broad thesis of the Commission in suggesting reforms in the staffing of higher administration. As one goes through the Report and reaches the end, one perceives a persistent undercurrent of a single theme running across; it is to diminish and circumscribe the role of the Indian Administrative Service in the personnel structure of the country and to buttress and augment the role of the uni-functional* non-technical and technical Services.

Before any itemized analysis of the recommendations can be attempted, it is necessary to examine whether this approach is consistent with national interests, determined with reference to historical compulsions of our country. One may, therefore, to begin with, trace the historical growth of the All India Service concept, the presumptions on which it

*All through this article, the use of the word 'generalist' and 'specialist' has been avoided because the author believes that this nomenclature is not neutral and factual, but involves a value judgment. Instead, the phrases 'professional administrators' for I.A.S., 'uni-functional non-technical Services' for Services like the I. A. & A.S., I.R.S., Postal Service, etc., and 'technical Services' for cadres of Engineers, Scientists, Doctors, etc., have been used.

was based and then ascertain whether this concept has an increased or reduced validity in the current national environment.

(I) THE HISTORICAL GROWTH OF THE CONCEPT OF AN ALL INDIA SERVICE

A critical study of the Indian history invariably brings into focus an almost built-in centrifugal tendency which has resulted in external aggressions from time to time. Various reasons could be ascribed to this phenomenon like the size of the country, the language, religious and cultural diversities or a weak sense of national cohesion; yet the fact remains that all along the gamut of Indian history, strong central kingdoms have alternated with broken and weak principalities. The ancient lore of India describes vividly the attempts of rulers to become 'chakravarties', a stature which was considered an acme of achievement and yet these chakravarty-empires almost fell as inevitably as they were formed. When Alexander came in 326 BC, the country was divided into small *janpadas* and he had little difficulty in subduing the people; on the other hand, when his successor Seleucus tried to repeat the performance, the Mauriyan Empire had already come into existence and he had to suffer a crushing defeat. As the Mauriyas weakened, the Kushans came and when Guptas went under, the Shakas and Huns emerged on the scene. After Harshavardan, there was almost a total dismemberment of the Indian sub-continent into small Rajput principalities that could not withstand the fierce Islamic attack. Onee again, the cycle repeated and the Mogul power spread far and wide in the sub-continent, to weaken again by the time of Bahadur Shah and court aggression from various quarters, including the British. There cannot be two views that notwithstanding the formation of mighty and large kingdoms, the centrifugal tendency has asserted again and again and has always been a force to reckon with.

With their keen historical sense, the British attempted an administrative solution of this historical problem. Through the concept of an All India Service competitively recruited, they strengthened the sinews of administration by arranging the posts at the district, regional and central levels into a comprehensive system. Through the method of rotation, tenures and transfers, they eliminated the possibility of personal loyalties developing in any region for it were these personal loyalties to subedars and satraps which had always brought the downfall of central authority in Indian history. Over a period of time, an administrative structure arose which was impersonal, in touch with the grassroots and based on traditions which permeated all levels of

authority. Further, to diminish individual variations, if not to eliminate them, they clothed authority in a framework of law, rules and regulations, with the result that cohesion of British administration became a byword and the Indian Civil Service came to be known as the 'steel frame'.

When Independence came, our national leaders were quick to see the advantages of this administrative system even in the changed context; while the British goals and the Indian goals were poles apart in other matters, they were identical so far as the country's integrity was concerned. In a federal and democratic structure, which they had decided to incorporate in the Constitution, the advantages of a Service operating at the districts, the State headquarters and the Union Government were obvious and compelling. Sardar Patel[1], speaking in the Conference of the Premiers in 1946, succinctly stated the advantages of such a Service.

> "My own view, as I have told you, is that it is not only advisable but essential if you want to have an efficient Service, to have a Central Administrative Service in which we fix the strength as the provinces would require them and we draw a certain number of officers at the Centre, as we are doing at present. This will give experience to the personnel at the Centre leading to efficiency, and administrative experience of the district which will give them an opportunity of contact with the people. They will thus keep themselves in touch with the situation in the country and their practical experience will be most useful to them. Besides, their coming to the Centre will give them a different experience and wider outlook in a larger sphere. A combination of these two experiences should make the Service more efficient. They will also serve as a liaison between the provinces and the Government and introduce certain amount of freshness and vigour in the administration both of the Centre and the Provinces. Therefore, my advice is that we should have a Central Service."

Even on the question of much criticised security of this Service, Sardar[2] was not prepared to compromise.

> "There are parties and cliques outside which always, if you have got the power, put pressure on you to take action against an officer who is not willing to accept suggestions made by them which are not always wise, you will lay the Services open to many

[1] *Proceedings of the Premiers' Conference* — October, 1946.
[2] *Ibid.*

influences which are very undesirable.... Almost all of us have considered this question in the Interim Government and we unanimously came to the conclusion that the only way to secure an efficient Service is to give them protection from influences which will corrupt them."

The performance of the Indian Civil Service at the time of the transfer of power fully justified the confidence which the national leaders had placed in the system inherited from the British. The Indian element of the ICS, hitherto suppressed and discriminated against in a joint cadre with the British, rose to a pitch of patriotism and devotion, unknown in the annals of resurgent nations. The Service literally spelt the difference between order and chaos and gave such loyalty to Mr. Churchill's "men of straw" that in spite of a minor war in Kashmir, gigantic refugee problems, and break-down of administrative fabric due to the partition of the Services, the integrity of the Union was preserved. Whether it was external affairs or defence, public finance or Constitution making, rehabilitation of refugees or States Reorganization, there was no segment of Government activity which did not bear an imprint of their sustained endeavour. Speaking in the Constituent Assembly debates, Sardar Patel[3] not only paid tributes to the Indian Civil Service, but also emphasized that in a federal constitution, there was no alternative to this administrative system.

"I wish to assure you that I have worked with them during the difficult period—I am speaking with a sense of heavy responsibility —and I must confess that in point of patriotism, in point of loyalty, in point of sincerity and in point of ability, you cannot have a substitute. They are as good as ourselves.... I wish to place on record of this House that if during the last two or three years, most of the members of the Services had not behaved patriotically and with loyalty, the Union would have collapsed.... the Union will go, you will not have a united India, if you have not a good All India Service, which has the independence to speak out its mind, which has a sense of security that you will stand by your word... if you do not adopt this course, then do not follow the present constitution. Substitute something else. Put in a Congress constitution or some other constitution or call it R.S.S. constitution. Whatever you like, but not this Constitution. This Constitution is meant to be worked by a ring of Service which will keep the country in tact. There are many impediments in this Constitution which will hamper us. But in spite of that, we have in our collective wisdom come to a decision that we shall have this model wherein

[3] *Constituent Assembly of India Debates* — Volume X, No. 3, 10 October, 1949.

the ring of Service will be such that will keep the country intact ... These people are the instruments. Remove them and I see nothing, but a picture of chaos all round the country."

Clearly, the model of the Indian Administrative Service, on the pattern of the Indian Civil Service, was adopted with great deliberation and forethought.

Distinguished foreign observers have admired the uniqueness of this system. Paul Appleby,[4] who came from the land of "lateral entry and position classification", admitted:

"The absolutely first class character of the Indian Civil Service and the yet to be fully demonstrated but probable like character of the Indian Administrative Service are attributable chiefly, I think, to the developmental experience they have been subjected to. Personal tutelage in the early stages, rapid movement from post to post, high expectations and the early and constant assignment of responsibilities taxing their capacities caused extraordinary growth in competence ...."

The generalist superiority in the Government of India attracted Paul Appleby's[5] attention and he warned against copying models from abroad in a different historical setting:

"Some elements of distinct superiority also should be cited, pointing to a general judgment of the Government as rating among governments of an advanced sort and not among those of backward nations; practices appreciative of the importance of the generalist—as opposed to the merely expert—control of government in high levels, associated with a widespread capacity for thinking in the relatively abstract terms of relationships. In handling highly complex affairs, these practices and this capacity are of great importance."

During the post-Independence period, one or the other aspect behind the concept of the IAS, was repeatedly emphasized. The States' Reorganization Commission thought of them as the cementing force in an otherwise fissiparous atmosphere. To some, their field

[4] Paul H. Appleby, *Public Administration in India — Report of Survey*, Delhi, Manager of Publications, Government of India, 1953.

[5] *Ibid.*

experience eminently qualified them for higher policy jobs. Pandit Nehru,[6] in 1960, stated:

> "Inevitably administration, of course parts of it, specially in the Secretariat and the like, is apt to become cut off from the human side. It is not cut off if you are a District Magistrate; you deal with the human side all the time in a dynamic and moving society where you have to move and move along with masses of people. It is very important to have the human approach and I do not know how any school can teach the human approach."

Even Administrative Reforms Commission's own Study Teams have repeatedly emphasized the importance of the All India Service concept. The Setalvad[7] Team on "Centre-State Relationships" summed up the proposition beautifully:

> "The Indian scene has changed in many ways since then. But in this respect, the change that has occurred over the years serves only to confirm all that Sardar Patel said with prophetic insight many years ago. It should be needless to affirm the continued validity of all the objectives underlying the All India Services and yet, in a country in which the constituent parts are possessed with a pre-emptive desire to assert their separateness, such an affirmation is solely needed. The value of a system considered necessary for the administrative unity of the country, despite the ubiquity of Congress party rule and found indispensable for securing fairplay and competence in administration, despite the acute awareness of their need in the most potent political figures at a time when their power was untrammelled and their writ ran through the length and breadth of the land, can in the less favourable conditions of today be ignored only on pain of perilous consequences. Continuity alone demands a system which can maintain links in administrative behaviour throughout the country while political changes visit different States and the Centre."

The Patil Study[8] Team repeatedly emphasized the value of Indian Administrative Service.

"The Secretariat must have people who have knowledge of field

[6] "Prime Minister's Address at the Annual Meeting", *The Indian Journal of Public Administration*, Volume VI, No. 4 (Oct.-Dec.) 1960, pp. 336-37.

[7] *Report of the Study Team on Centre-State Relationships*, Administrative Reforms Commission, New Delhi, September, 1967.

[8] *Report of the Study Team on Personnel Administration*, Administrative Reforms Commission, New Delhi, October, 1967.

problems and conversely, people in the field must have an understanding, if not actual experience, of the way in which policy makers function at the higher levels. Within the federal structure of our country, there is need for inter-change between the Centre and the States; so that each unit of administration understands the problems of the other... those whose experience is limited to routine functions during the formative period of their life, would be severely diminished in the intellectual and emotional qualities needed for the formulation of bold and broad programmes at the higher levels. They cannot become superior to the system in which they have grown. The tragedy is that when they emerge to the top, their personalities are so stunted that they are incapable of moving without complete assurance and are unwilling to incur risks.... In the context of the new situation in which the system of communication at the political level through a common political party is breaking down with the emergence of governments and administrations with different political shades in the country, the common administrative link for an uninterrupted exchange of information and experience of understanding among the different tiers of government appears to be all the more necessary.... Thus, not only do the original considerations on which the Indian Administrative Service was set up in the beginning hold good even today, but they apply even with greater force in some respects. There are also some additional reasons like the emergence of a new type of representative government, which make it necessary that the Service structure like the Indian Administrative Service should continue for the foreseeable future."

To recapitulate, the assumptions behind the All India Service concept, which are valid even today, were:

(*a*) the usefulness of district experience for development of qualities of co-ordination, human understanding and man management, which are an asset for performing the secretariat functions of policy-making and co-ordination;

(*b*) early experience at sub-divisional and district levels in exercising choice between competing claims, which is useful in the secretariat where constraint of resources involves high selectivity;

(*c*) early legal training as magistrates and revenue officers, which again is of advantage in the secretariat where Constitution has to be kept in view, laws have to be framed, rules and regulations prepared and parliamentary work of the Minister attended to;

(*d*) actual participation in the total tasks of development at the district level which helps build the right perspective for a meaningful contribution at the headquarters where such schemes are planned and projected;

(*e*) the feeling of belonging to an elite, which has a direct stake in the integrity and development of the country.

It is worth noticing that the value of the elite concept has been felt even in countries like the United States, which had no tradition of it. The Task Force on Personnel and Civil Service appointed by the Hoover Commission[9] visualized such a Service for U.S.A. consisting of persons who:

> "should be given an appointment, resembling that of a commissioned officer in the Armed Forces, in that they would have status, rank and salary as individuals and could be employed flexibly in a number of authorized positions calling for high administrative talents. The primary objective is to have always at hand in the government a designated group of highly qualified administrators whose competence, integrity and faithfulness cannot reasonably be questioned; who will make it easier for political executives to discharge their responsibilities .... Experience in more than one charge, experience in both staff and line, operating work and experience in both the departmental and field services."

In addition, it is common knowledge that in many big private industrial units, recruitment of an elite through the system of 'Management Interns' is quite in vogue.

Having discussed the historical growth of the All India Service concept, we shall now examine the recommendations of the Commission which impinge on this structure and their implications.

(II) THE RECOMMENDATIONS OF THE COMMISSION IN RESPECT OF HIGHER ADMINISTRATIVE JOBS AND THEIR IMPLICATIONS

To begin with, a point could be raised that nowhere in their Report, the Commission have recommended the abolition of the IAS, and, as such, the conclusion that the All India Service concept has suffered a serious setback, is not valid. Obviously, in the present national environment, when fissiparous tendencies are pronounced and Union-States relations at a low ebb, no Commission could have recommended

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[9] U.S.A. Commission on Organization of the Executive Branch of the Government, *Report of the Task Force on Personnel and Civil Service*, Washington, 1955.

an outright abolition of the IAS in the background of powerful historical arguments already enumerated in Section I of this article. The Commission's handiwork lies in so arranging a series of recommendations that the cumulative result would be:

(*a*) migration of talent from IAS to other uni-functional Services like Income-tax, Audit, Postal, etc., and

(*b*) progressive reduction of senior jobs to which IAS officers would be eligible.

The recommendations which bring forth this situation, may now be enumerated:

(*a*) Recommendation 1(2) fixes a functional field for the IAS which should consist of land revenue administration, exercise of magisterial functions and regulatory work in the States *in fields other than those looked after by other functional Services*;

(*b*) Recommendation 2(1) envisages that all posts in a functional area—whether in the field or at headquarters or in the secretariat—should be staffed by officers of the corresponding functions, implying thereby that the posts open to the IAS shall be in the functions described in (*a*);

(*c*) Recommendations 3 and 5 envisage classification of posts into functional and non-functional categories and stipulate that the functional posts may be filled by the officers of each functional Service and the posts on non-functional side at the level of Deputy Secretary or equivalent at the Central headquarters should be demarcated into 8 specialisms and selection should be made by a written examination to which Class I officers of various functional Services (including the IAS) should be eligible (between seniority of 8-12 years);

(*d*) Recommendation 6 which is for posts above the level of Deputy Secretaries maintains the distinction of functional and non-functional; the functional posts are to be filled by the respective functional Services and the non-functional posts from the Policy and Management Pool constituted at the Deputy Secretary's level through the written examination mentioned above;

(*e*) Recommendation 8 provides for a pay plan in which all Class I Services, including the IAS, have been provided an identical grading structure and almost similar promotion prospects;

(*f*) Recommendation 11(2) envisages a single common examination for the IAS and other uni-functional non-technical Class I

Services with the candidates being given the option to go for any Service they choose;

(*g*) Recommendation 44(1) envisages that in both All India and uni-functional Class I Services, promotion from one grade to another in the junior and middle levels should be made by Departmental Promotion Committees.

The consequences which flow from these recommendations are obvious. Firstly, all uni-functional Central Services have been raised to the level of the IAS in salary and promotion prospects. This would mean that the candidates recruited through the common competitive examination will necessarily, other things being equal, opt for Services which are less burdensome and whose postings are mostly in urban areas. With all terms and conditions almost similar, there would be no incentive to opt for a hazardous Service like the IAS in which prolonged stay in rural areas is imperative, where responsibility is great and the decisions to be taken, particularly in the field of law and order, are extremely difficult. People, by and large, would choose jobs of a secure type like auditing of accounts and assessment of Income-tax, etc., than go to the districts and face mobs. Secondly, by defining the functional area for the IAS narrowly, it has been seen that most of the higher jobs would not be available to the members of this Service. Thirdly, by introducing a written examination for the non-functional posts at the level of Deputy Secretary and above, it has been ensured that the officers of the IAS already starved of talent because of the preliminary choice after the competition being heavily weighed against them, would also be at a disadvantage in this written competition since their long postings in the field would put them to a handicap in relation to the Services, which are in urban areas and operating in a more sophisticated environment. Fourthly, by devising a pay plan in which the IAS officers serving in the States have no financial incentive to come for Central jobs (with the abolition of special pay), the number of such officers coming to the Centre would automatically diminish. Fifthly, by providing a number of efficiency bars in the pay plan, the security of the Service, which was so much emphasized by Sardar Patel, has been greatly compromised; by the very nature of their jobs, they are open to diverse pressures and blackmail and their morale would suffer grievously if many hurdles are created in relation to their promotion prospects.

With the above stipulations, obviously the Service would slowly fade away and bow out from the Indian administrative scene as an effective instrument. Without directly advocating its abolition, the Commission have damaged its unique character and rendered it incapable

for the momentous role envisaged for it by the makers of free India. The report has avoided the crudity of direct assault and has preferred slow annihilation. The tiger kills; but the bear is known to lick its victims to death.

Rightly, some members of the Commission could not agree with such drastic recommendations. Shri T. N. Singh, in his minute of dissent, states:

> "However, after studying the categories of functional and outside functional Services, I have come to the conclusion that the Commission, in their anxiety to provide the fullest scope for the advancement of various Class I Services, have, I believe, unwittingly given greater advantages to the desk workers as against officers who are or have been field workers, so far as junior and middle management groups are concerned.... Unfortunately, the Secretariat at Delhi in recent years, particularly at the junior and even at the middle management levels, has been manned by people who have had largely desk experience only.... This dominance of the desk worker, of the urban-oriented officers in Delhi, must be radically altered if we are to have an administration with a real capacity to understand the common man's needs and desires. I, therefore, feel that the entire approach in regard to the staffing and promotion at the Central Secretariat at junior and middle management levels and probably, the scheme of classification of categories has to be altered, so as to enable officers with field experience in the States and at the Centre to occupy positions at junior, middle and higher management levels.... It is essential that we should have as much traffic between officers of the States and the Centre as possible. As a matter of fact, it is good for officers belonging to the State Services to come to Delhi for a period and then go back. They will develop a wider outlook in addition to their actual field experience. Similarly, a situation where Class I and II officers of the Centre remain all through their life desk workers only and yet influence government decisions at junior and middle management levels is not desirable."

About the classification of functional and non-functional areas, Shri T. N. Singh further states in this minute of dissent:

> "According to me, some of the functional areas are not so functional in the strict sense of the term. There are departments which though described as functional, are of a generalist nature. Many of the IAS officers have had a very good background of work and

experience in socio-economic problems. To exclude them completely from certain socio-economic departments described as functional will not be proper. Under the scheme, as enunciated, it has been stated that functional fields for the IAS would consist of land revenue administration, exercise of magisterial function and work in the States in fields other than those looked after by other functional Services. I think we are taking a narrow view of things. . . . At the higher policy-making level, common sense, humanistic approach based on field experience and handling of men may work better than a purely specialist approach. Again, at such levels, quality of leadership and capacity to co-ordinate and regulate action matter a great deal. . . . In this context, I feel that we have unduly restricted the field of IAS officers. Their scope should be widened."

As regards the Commission's recommendation about the written examination for the posts of Deputy Secretary and above in the non-functional areas, both Shri Shankar and Shri T. N. Singh have dissented. Shri Shankar states:

"As regards recruitment to middle management posts, I do not think it is necessary to have a written test, at least for the members of the All India Services. They are recruited after a comparative assessment of merit. It is the better type of candidates with better academic records who enter into these various Services and the need of a written test after the prescribed number of years of service merely to assess certain qualities is, to my mind, redundant and is reflection on the quality of persons that would be recruited for the All India Services. The nature of their duties and responsibilities is such that their required qualities are bound to develop in the course of their service and any test merely to find out the extent of these qualities, to my mind, is uncalled for."

Shri T. N. Singh agrees with the above observation in the following words:

"I have great doubts about the suggestion for a written test for promotion to the middle management level. It is likely to be unfair to the officer who has worked for a number of years in the field against others. It will also be difficult to evolve a common syllabus for diverse Services."

The Patil Study Team[10] had also doubted the value of written

[10] *Report of the Study Team on Personnel Administration, op. cit.*

examinations for assessing required administrative merit:

> "The written examinations, however, have severe limitations with regard to assessing the quality and experience gained or skills acquired by individuals during one's working life as, by definition, these skills are not amenable to reduction to a common denominator, capable of being tested by a written examination."

Having examined the main recommendations of the Commission which, if implemented, would disrupt the existing and historically tested administrative structure by substituting an experimental framework of a controversial nature, the broad assumptions behind the overall approach of the Commission may be analysed in detail to ascertain their validity. If each distinct assumption is found to be of doubtful value, the entire superstructure of the Report, built on the basis of these assumptions, will call for fresh thinking.

(III) THE COMMISSION'S ASSUMPTIONS AND THEIR ANALYSIS

The main assumptions which have led to the various recommendations of the Commission, may now be examined item-wise.

No. 1: *It is possible to divide Secretariat posts into functional and non-functional categories*

The Commission have not suggested any yardstick by which such a classification could be effected; indeed, such a classification of the Secretariat posts would be impossible. Once the details of the process are entered into, it would be discovered that even after following the Commission's broad guidelines, most of the jobs have a functional as well as a non-functional component and, as such, their allocation to any particular category would become arbitrary. It is not understood on what grounds the Commission have placed agricultural administration and financial administration into a non-functional category. An equally valid view could be that their major content is functional. It might be mentioned that even the Fulton Report, which has laid great emphasis on specialization in administration, did not attempt the classification of all posts of White Hall into functional and non-functional categories. The farthest they could go was:[11]

"The Service should develop greater professionalism both among

[11] *The Civil Service*, Report of the (Fulton) Committee, 1966-68, London, H.M.S.O., 1968.

the specialists (*e.g.*, scientists and engineers) and administrators (*i.e.*, the new counterparts of the present administrative and executive classes). For the former, this means more training in management and opportunities for greater responsibility and wider careers. For the latter, it means enabling them to specialize in particular areas of government. We identify two such areas and accordingly recommend the development of a group of economic and financial administrators, and a second group of social administrators."

In other words, the utmost that the Fulton Report could envisage was to demarcate areas of activities in which administrators may specialize. The ARC Report, on the other hand, divides the Secretariat jobs into functional and non-functional, further divides the non-functional into 8 specialisms, and recommends the earmarking of each post with reference to this classification. In a rapidly developing and complex administrative situation, this formula approach would be neither workable nor desirable.

No. 2: Management and administration are interchangeable concepts

A major reason for the confusion in the personnel structure envisaged by the Administrative Reforms Commission is the failure to distinguish clearly between management and administrative functions, with particular reference to the role of a Secretariat. The two terms are almost interchangeably used throughout the Report. Professor Robson, in his article in the Political Quarterly of October-December, 1968,[12] has referred to the House of Lords debate on the Fulton Report where this distinction was brought into focus:

"Lord Pilkington said that an administrator was not the same as a manager. Civil servants who are on the way to the top require a combination of qualities that makes this a quite different profession from that of management. Lord Plowden remarked that the Fulton Committee in emphasizing management had failed to define the administrator's role in a parliamentary system of government. The most important part of his job is to serve ministers and to see that the departments are run in a way which seems fair to the public. The quality of judgment is of the greatest importance and it would be disastrous if administrators were to think of themselves as engineers, economists or sociologists."

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[12] William A. Robson, "The Fulton Report on the Civil Service", *Political Quarterly*, October-December, 1968.

The crucial difference, thus, between an administrator and a manager is that while the former has to look upwards as an adviser on policy, the latter has a downward orientation towards the machine he is supposed to manage. Viewed in this context, the Secretariat function, as a staff agency to enable the ministers to discharge their parliamentary obligations, is essentially administrative. The qualities which the civil servants in the Secretariat need are not so much a managerial talent to look after the subordinate agencies, as an administrative skill to render advice to the ministers on the basis of their vast experience in the field, in the States, and in a variety of jobs. While a civil servant in the Secretariat ought not to have any political affiliation, he must have a political sense, an alertness of mind to ensure that his minister is not landed into difficulties in his parliamentary work and a capacity to anticipate intelligently the probable reactions of the State Governments to various Central policies. In addition, he has to possess a legal bent of mind to operate within the framework of the Constitution, the laws, the rules and the regulations. Obviously, these qualities are very different from managerial skills and can come only through legal training and experience of a variety of jobs in districts and at State headquarters. Without an intimate touch with the masses of a nature which comes from holding territorial charges, the staff function in support of the minister at headquarters cannot be executed properly.

No. 3: Specialists are equally well equipped to man the Secretariat posts as professional administrators*

This fallacy is clouding thinking on Public Administration in modern times so much that it is essential to examine it minutely. Once it is established that the Secretariat function is essentially an exercise of choise between competing claims for limited resources, it becomes obvious that any person whose attachment to his particular speciality borders on dedication is unfit to exercise this selectivity function in relation to the claims of other specialities of which he might know nothing. To put a specialist in a deciding position is tantamount to making a party, the judge. Indeed, specialization is reaching such finer degrees and there are so many sub-divisions in what superficially appears to be a particular discipline, that the problems of co-ordination have become formidable. Shri Shankar, in his minute of dissent to the Report, brings out this point forcefully:

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*The phrase 'secretariat posts' has been used throughout the article to include the posts in the regular hierarchy like Under Secretaries, Deputy Secretaries, Joint Secretaries, Additional Secretaries and Secretaries. The posts of Advisers, Officers on Special Duty, Consultants, etc., are not included in this term.

"Whilst there is no doubt that administration is assuming in different branches more specialized character, we have to recognize the fact that in the technological and scientific fields also, the specialization is even more minute and it is not easy to find a generalist—scientist or a generalist technocrat—who would be able to do adequate justice to all the branches and subjects of certain scientific and technological departments. Ultimately, whether we take the functional or non-functional areas, the need is that of persons who have sufficient objectivity and general managerial competence, can rise above the narrow fields in which they would generally be working most of the time and can do adequate justice to the entire field of scientific or technological administration."

The important thing is not that specialists should occupy positions of co-ordination, but that there should be no barrier in their point of view reaching the top levels of Government. Of this, there has been no complaint. Shri Shankar again, in his minute of dissent, says:

"I would not subscribe to the view that in decision-making, the scientist or the technologist is being ignored or is not having an adequate voice. This may have been true a decade ago, but certainly not today when the relations between the Minister, the Secretary to the Government and the scientific or technical heads of departments are coming closer and closer still and not unoften, a Minister has direct access to the scientific or technical head of the department."

The following pitfalls in appointing specialists to Secretariat posts may be noted in addition:

(*a*) A specialist's approach to the requirements of financial economy is bound to be liberal when the expenditure is to be incurred in his own field of speciality. His dedication would, more often than not, prevent a correct appraisal of the resource position.

(*b*) Broad common sense views would be replaced by doctrinaire and theoretical considerations. The so-called specialist knowledge is invariably theoretical knowledge. Most of the captains of industry had not a course in Industrial Management, the price forecasting experts of statistical organizations are not known to have made a pile on the Stock Market and a professor of Public Administration could not even manage a sub-divisional charge, leave apart the requirement of facing mobs and quelling riots as a District Magistrate.

(*c*) The departmental loyalty in their case is likely to supersede the loyalty to the Government as a whole. This can lead to an unhealthy competition for cornering resources.

(*d*) In the field of Personnel Administration, their capacity to give justice to their subordinates is limited. Having grown in the department, they pick up friends and foes in the process and lack the detachment which an outside professional administrator possesses. As secretariat is the last level of appeal in personnel matters, its officers should have not preformed views.

(*e*) It is recognized that there is a dearth of specialists in practically every field. In such a situation, it might not be prudent to divert them to administrative jobs because as experience has shown, once they are overtaken by administrative problems, their contribution to their speciality rapidly diminishes.

From the point of view of empirical evidence, one could examine the performance of some organizations in the Government of India which have been dominated by specialists. The Ministry of Education and the Planning Commission immediately come to notice. It would indeed be difficult to say that the performance of these two organizations has been in any way heads and shoulders above the rest of the Ministries, which are mostly staffed by professional administrators. The Patil Report[13] brings out the point clearly:

> "The claim that all ills can be cured if only the so-called 'generalists' were removed from the scene and specialists with any background whatsoever, replaced them is obviously naive. One possible basis for arriving at a valid conclusion could be our experience of the last fifteen years or so. Is there any evidence to indicate conclusively that departments manned by appropriate specialists even at the highest level have generally fared better and the departments manned by non-specialists have fared worse?"

Professor Robson, in the article quoted above, has mentioned that most of the failures of the Labour Government have been due to the excessive reliance on experts.

No. 4: *It is possible to determine merit by repeated selections and introduction of Efficiency Bars in the Service structure*

The Commission has neither defined merit nor devised a plan for locating it from among a variety of backgrounds and experiences. For

[13] Report of the Study Team on Personnel Administration, *op. cit.*

the IAS, which has to attend to a variety of jobs, not only there can be no common definition of merit, but diverse types of qualities are actively encouraged for diverse types of assignments. A conformist approach in such a Service could be deadly. Entirely different types of temperaments and qualities are needed: (*a*) to control a turbulent district; (*b*) to discharge a staff function like the Secretary to the Chief Minister; and (*c*) to head a State commercial enterprise with a big negotiating component.

Secondly, in a country like India, excessive emphasis on the merit principle can lead to widespread demoralization because the caste, regional and clan loyalties could make a hash of such a scheme. One is reminded of a conversation between a distinguished Ambassador of India and a senior officer of the External Affairs Ministry when the former was pressing for an out-of-turn promotion of a subordinate who had shown outstanding merit. The Ambassador was told:

> "Maybe the merit of the subordinate in question is conspicuous, but if today he is given a promotion in violation of the established norms, tomorrow somebody's son-in-law is going to possess all the merit."

As regards the Commission's design of too many efficiency bars in the form of short grades, not only this arrangement would severely circumscribe the discretion of Government in posting officers in a flexible manner without the idea of supersession creeping in, but would also demoralize Services like the IAS, who have to operate under considerable political pressure. The Commission themselves have noted these possibilities:

> "In any society, influences for gaining personal ends are always at work. One has to be particularly wary of such influences in a democratic set-up, where the seats of power are occupied by people's representatives who are perforce required to be in constant touch with the public."

It is tragic that having anticipated the possibility, they have evolved a remuneration plan in which senior officers will have constant fear of being passed over for political indiscretions.

No. 5: Written examinations are a suitable method of determining acquired administrative talent

The Commission have at various stages introduced written

examinations for selecting personnel for higher posts even from working Government servants. Written examinations are suggested for:

(*a*) Filling up Policy and Management Posts in the non-functional area;

(*b*) Initial entry into Class I Services;

(*c*) Entry into Class I Services by Method II;

(*d*) For employees who have completed 6 years of service and are below 35 years for entry into Class I Services;

(*e*) Promotion from Class II to Class I Services; and

(*f*) Promotion from Class III to Class II Services.

As already pointed out by Shri Shankar and Shri T. N. Singh, in their minutes of dissent, a written examination for the Policy and Management Pool is of doubtful value. More amusing is the examination of First Class graduates of the Universities for Class I posts. Firstly, no account has been taken of the fact that the quality of First Class graduates differs from University to University. Secondly, there are certain subjects in which it is easy to secure First Class marks than in others. In the Commission's scheme, while a first class graduate of Rewa or Bhagalpur University would be eligible to sit in this examination, a person securing 58 per cent marks in Madras, Calcutta, Allahabad or Delhi Universities would be ineligible. Similarly, while a first class post-graduate of Arabic, Persian or Sanskrit would be eligible to sit, a high second class of History, Political Science or Economics would be excluded. In addition, it has not been examined how suitable syllabi will be drawn for examinations for which entry would be from such diverse sources. The administrative implications of so many examinations and their diversionary influence on the quality of work of public employees has not been taken into account. The cumulative upshot will be that these examinations with consequential supersessions will create unprecedented demoralization in the Services where no one would believe that merit has been rewarded, but a lingering suspicion would remain that other factors have played their part.

No. 6. Lateral Entry is a Proper Method of Inducting Talent in Government

Probably, the Commission have been impressed by the U.S. example of lateral entry and the high turn-over rate between public and private employment. The experience in India has been otherwise because here, in the private sector, a person either makes or mars his

reputation within the first ten years or so. Those who make a mark are ewarded so lavishly that no incentive is left to migrate to the relatively low paid government jobs. Lateral entry in India, therefore, becomes a method of picking up the leftovers of private employment. It might be mentioned that the experience of Government with open market recruitment to the IAS, was not happy and this method has not been revived in spite of a persistent shortage in the cadre. Even in the Judiciary, a situation has arisen where the top layers are no longer interested in High Court Judgships because of the fall in income involved. The result has been a relative fall in quality in the recruits from the Bar and one view is that an All India Service for Judiciary should also be designed to attract talent at a fairly young age. Lateral entry in the Indian context would not be effective and its possible advantages would be heavily overweighed by the demoralization which would be caused to the regular Services when the lateral entrants are sub-standard. The Patil Report[14] states:

> "Perhaps, a necessary corollary to lateral entry is lateral exit at different levels, but this is not possible on an appreciable scale because of the heterogeneous employment market. In addition, the imperfect nature of selection techniques, specially for positions at the higher levels, may also be a factor; a few wrong selections of an *ad hoc* kind may cause demoralisation and discontentment in such a vast body of individuals that the consequent loss of efficiency may more than outbalance the gains of lateral entry."

No. 7: Each Service has some or the other form of field experience and that these experiences are comparable

Perhaps, a major error of the Commission has been to believe that the totality of grass-root experience, which an officer gets by holding a territorial charge as a Sub-Divisional Officer and a District Magistrate in the IAS, is comparable to the field experience which the members of the unifunctional Services get in the Postal, Income-tax, Audit or Railway Department. Frankly, one does not know what is the field experience of an Income-tax Officer or an Accounts Officer unless one was to stretch the concept and say that accepting or rejecting an income-tax return or maintaining a provident fund account or drawing up an audit report is a field activity. Even if it was argued that post offices are opened in villages and railway lines pass through rural territory and so some field contact is implicit in the functioning of these Departments, no large labour need be wasted to show that this type of fragmentary contact can have no comparison with the continuing day-to-day

[14] Report of the Study Team on Personnel Administration, *op. cit.*

involvement in rural problems, which is inherent in a territorial charge. For an Executive Engineer, the periphery of his rural contact is the construction of a road or a bridge, for a Veterinary Doctor, the problem of cattle, for a Medical Doctor, health and sanitation; on the other hand, there is no problem starting from flood-control, drought relief, provision of essential supplies, locust eradication, prevention of epidemics or any other matter impinging on the welfare of the people, which a Sub-Divisional Officer or a Collector can treat as not his own. Moreover, maintenance of law and order, internal security, prevention of communal trouble, labour and student unrest and agrarian discontent bring the people in intimate contact with territorial officers, though in a different context. In addition, the territorial officers act as the co-ordinating agency for all sectors of developmental activity and initiate, secure and sustain massive people's participation. In short, the field experience of the professional administrators and of the officers of the uni-functional Services are not at all comparable. The Patil Team has brought this out pointedly[15]:

> "It is difficult for us to imagine how an IAS officer who, in a total period of some 16 or 17 years, may have spent a fair amount of time in district administration and a fair amount of time also in considering and deciding at fairly high levels in State Governments and Departments on the policies that administration should follow, can be equated with another officer, the major part of whose career may have been spent in the discharge of responsibilities which cannot be called either executive or high level."

A similar error would be to believe that in terms of responsibility or quality of individual judgment required, there can be any comparison between uni-functional Services and the IAS. For instance, in the face of a rapidly deteriorating law and order situation: (*a*) whether to impose Section 144 Cr. P.C. or not, (*b*) when to use force and of what type, and (*c*) whether to fire or not to fire, involves a type of responsibility and a quality of judgment which even Heads of Departments in the functional Services are not required to exercise, what to say of the lower functionaries with whom the Collector's job is intended to be equated. The Commission's scheme may have a superficial charm of a democratic and egalitarian approach when they say that all Class I Services are alike and should have equal promotion opportunities; in truth, this would be equating unequals and the consequent deterioration in the quality of the high level personnel would be phenomenal. Talent from all sources would in reality mean talent from proximate sources and the preponderance of personnel drawn from urban offices would aggravate

[15] Report of the Study Team on Personnel Administration, *op. cit.*

further the growing hiatus between the Centre and the field. The example of the Central Secretariat Service is pertinent; as against an authorized quota of 45 posts at the Deputy Secretary level, its members have already cornered 115 posts and their efforts to capture the rest have by no means abated. This should be a pointer to those who believe that tapping of talent from all sources can be a practical proposition.

No. 8: The scientific and technical professions are cornering talent at a fairly early age from educational institutions and, as such, they should be given a fair share of higher jobs

This is another myth which requires to be exploded completely. Firstly, it is unbelievable that with a great dearth of opportunity for science education below the matriculation level in villages and small towns, a major segment of student intelligentsia can go for science education. A large number of pupils, with superior intellect, have to undertake arts education in the absence of these facilities. Secondly, the costlier nature of science education, particularly in the engineering and medical professions, dissuades the majority of intelligent but poor students from entering these professions. Thirdly, there are quite a few who, by deliberate choice, do not opt for science. In such circumstances to conclude, on the basis of a fractional urban picture, that the country's talent is migrating to scientific and technical professions would be illogical. The correct position is that in a relatively small sector of the population which can afford their children a technical education, such students as are security minded, embark for these safe careers. It would be a mistake to believe that the bulk of students who continue their education up to graduation or post-graduation are merely the left-overs from the filtering done in favour of the technical professions at an early age.

No. 9: Tenures militate against specialization

This seems to be the basis of the Commission's far-reaching recommendation that there should be no fixed tenure for the senior management posts in the Central Government. Since it is contemplated that officers with nearly 17 years of service will get into the senior management positions, the result would be that in a 34-year career-span which a direct recruit normally has, a period of 17 years or half of his service could be spent at the headquarters of the Central Government without going back to the State Government or to his parent department. Theoretically, it could happen that for these 17 years, a man may remain in the same Ministry. Even when tenures are prescribed for posts,

pressures are built up to continue in the Central Government on one pretext or the other; with the Commission's formula of no fixed tenures, slowly a body of functionaries will emerge at the Central headquarters who would have lost all touch with the problems of the people and would have transformed themselves into proficient desk workers. This type of specialization would be not only detrimental to the quality of the Central Government, but would widen the gulf between the people and the top functionaries.

In reality, the formula approach, which the Commission have adopted to solve personnel imbalances, has given to their model a wooden rigidity and, if this model is implemented, Governments, both in the States and the Union, would find their hands tied to make a flexible use of the administrative machinery at their disposal. Under the garb of specialization, equalization and democratization, a structure has emerged which militates against the one dominant virtue of Indian administration: its resilience and flexibility in moving personnel from the field to the State headquarters and the Union, and *vice versa*.

(IV) CONTRADICTIONS, OMISSIONS AND UNANSWERED QUESTIONS

The Report abounds in a variety of contradictions, some of which deserve to be noted:

(*a*) In the Chapter on Recruitment, the Commission state:

> "An unhappy feature of recruitment to Government service in India is the great disproportion between the number of posts available and the number of aspirants. Sometimes, the ratio is as much as 1: 100 or even more. Not only the expenditure and inconvenience involved in examining a large number of candidates for a few positions are great, but the spectacle of so many persons making applications and getting disappointed is a dismal one. Furthermore, the large number of applications that need to be processed and the equally large number of candidates who need to be examined and evaluated is a frequent source of delays. Some means should, therefore, be devised not only to limit the number of applicants to a reasonable level, but also to speed up the actual recruitment procedures."

However, for the Combined Examination for Class I non-Technical Services, the Commission, in addition to the method already in vogue

and covered by their Recommendation No. 11(2), propose two mo examinations as follows:

> *Recommendation* 15(1): "Special Competitive Examinations fc non-Technical Class I Services" may be held for first cla graduates who have an aggregate of not less than 60 per ce marks either at the first degree or in Master's degree.

> *Recommendation* 16(*b*): " Everyone who has completed six years service in Government and is less than 35 years of age may be give one and only one chance to sit for the open competitive examinatio for Class I non-Technical Services, *irrespective of the chanc already taken*, provided that he fulfils conditions relating to educ tional qualifications."

These two examinations, in addition to the one already in existenc would take the number of candidates for Class I Services to unmanag able proportions. Actually, sky is the limit for candidates in tl examination recommended in 16(*b*); in practice, it would mean that a graduates in government employment in the Union or the States, Unio Territories, public sector undertakings, etc., would be eligible t compete.

(*b*) Throughout the Report, the Commission have accepted tl principle of position classification to determine the qualification difficulties and responsibilities of various jobs with a view to fixing tl rates at which they should be remunerated. Yet, without waiting fc the findings of such a classification, they have devised a pay plan i which the horizontal relativities of various assignments have been inco porated on an *ad hoc* basis. In Recommendation 8(1), th Commission state:

> "The posts in the Civil Service should be grouped into grades, s that all those which call for similar qualifications and simil difficulties and responsibilities are grouped in the same grad The number of such grades may be between 20 and 25."

In sub-para 2 of this very recommendation, the Commission witho waiting for the findings of evaluation contemplated in Recommendatio 8(1), proceed to devise a pay plan and recommend 9 common pay scale

> "All the Class I posts may be evaluated and assigned to say common pay scales, an illustrative chart of which is attached the end of this Chapter. These nine grades of pay scales may l

divided into three levels, *viz.*, junior, middle and senior. The progress of an officer of an established Class I Service among the grades within each level should be on the basis of proved performance. Promotions from the junior to the middle level and from the middle to the senior level should be by selection."

It is strange that before position classification of nearly 10 million posts in public employment is completed, the Commission decide to venture into an illustrative pay plan. Nobody could anticipate the conclusions of an enquiry of this nature. It might not only basically alter the horizontal relativities of various positions, but could even bring out that certain Class I Services are redundant. For instance, in any objective position classification, the jobs of Sub-Divisional Officers, District Magistrates, Secretaries and Chief Secretaries of State Government may not be found less onerous than the jobs of Under Secretaries Selection Grade Directors, Joint Secretaries and Secretaries in the Union Government, respectively. With such unpredictable conclusions likely to emerge from a total position classification, any pay plan even of an illustrative nature, could not have been attempted. Shri Shankar, in his minute of dissent, realizes the inherent contradiction of this approach when he states:

"We have not gone into details of the functions of the various posts and arrived at the corresponding nature after scientific assessment. What has been suggested in the proposed structure is merely intended to exemplify what we have in mind rather than concretise it."

More debatable is the Commission's approach to starting position classification from the top and then move downwards.

"After all the Class I posts under the Centre and those to be manned by All India Services in the States have been evaluated and allotted to the various grades, other posts at the Centre as well as in the States can be taken up for examination and the entire Civil Service brought into a framework of 20 to 25 grades."

This inverted method of position classification has not been attempted in any country. The normal method is to work from bottom upwards, so that a system is gradually built up; the minimum levels are determined first and on their basis, the maximum responsibilities and emoluments are evolved. The Commission have also ignored an inherent tendency in position classification to become a "levelling up" process, as pointed out by Professor Robson and others. Experience

from Israel testifies to this conclusion. It is beyond doubt that if a comprehensive position classification for all categories of posts in public employment is attempted, a substantial additional load on the budgets of the Union and the State Governments would result.

(*c*) A similar contradictory approach is discernible when the Commission dwell upon the categorization of functional and non-functional posts. In Recommendation 3(1), they state:

> "Posts of or equivalent to Under Secretary or a Deputy Secretary in the Secretariat and the attached offices should be examined and classified as falling within (*i*) Functional, or (*ii*) Outside Functional areas."

Thereafter, they proceed to categorize the non-functional area into 8 specialisms, the guidelines for which are enumerated in paragraph 23 of Chapter 3 of the Commission's Report. Obviously, such a categorization like position classification is bound to be time consuming if it has to proceed in a scientific manner. The Commission themselves have recognized this. In their Recommendation 7, they say:

> "We recommend that the Department of Personnel should be responsible for working out the detailed implications of our recommendations for staffing the higher posts in administration."

However, after suggesting this enquiry, they again arrive at *ad hoc* conclusions. In paragraph 39 of the same Chapter, they suggest a number of transitory provisions for filling up these posts. Normally, the device of transitory provisions is employed in legislative enactments where, since a law comes into force immediately and the previous law stands repealed, certain transitory provisions are provided to prevent a vacuum. A commission of enquiry, on the other hand, ought to determine in absolute terms what is desirable and then leave it to government to examine the implications and to set the pace of alterations. Unless the object is to secure immediate benefits to a class of persons, a fact finding enquiry commission does not normally suggest anything of the nature of transitory provisions. The Commission's anxiety to hustle government can be noted at other places also. In paragraph 14, they state:

> "We would, however, like to emphasize that the proposals in Chapter III (An Outline of Reform—Need for Specialisation stand by themselves and are not to be considered as depending upon the implementation of the reform of pay structure proposed

above. Each of these two sets of proposals, *viz.*, those in Chapter III and in this Chapter (Unified Grading Structure—Its Importance to Personnel Management) stands by itself."

It is for anyone to see that classification of jobs, determination of their work-content and responsibility, their functional or non-functional nature and the scales at which they should be remunerated are all related problems and have to be studied in a comprehensive context.

(*d*) The real contradiction emerges when, on the one side, they repeatedly emphasize the need for contact with the masses, grass-root experience, field work and participation in developmental activity and, on the other, they suggest a personnel structure in which most of the higher policy and co-ordination posts would be filled up by uni-functional desk workers. In the letter of transmittal, the Chairman of the Commission states:

"India is still overwhelmingly the land of the rural people. A civil servant ought to know their needs and mores."

In the Chapter on Training, they further state:

"One of the main maladies in administration is the unintentional, almost unconscious, loss of touch with the masses. Many of our social and developmental programmes have come to grief because the officers have not been able to know the needs and mores of the people correctly. It is, therefore, of basic importance in a democracy like ours that the officers must have a rapport with the people and know their psychology and understand their ways. Three-fourths of the nation live in villages and it is they who are in greater need of amelioration and uplift."

After stating the proposition in such clear terms, they come out with a solution which is indeed amusing:

"We, therefore, recommend that every trainee should live in a village at least for a fortnight during the course of his training."

This 14 days sojourn in an Indian village is expected to compensate for:

(*a*) the progressive reduction of such officers from the headquarters of the Union and State Governments who had held charge of Sub Divisions and Districts for several years in favour of

Services who by their nature could not have a similar experience; and

(*b*) the constitution of senior management pools in which the officers selected may spend the last 17 or 18 years of their service without reversion to any field charge.

The fallacy of this solution is clearly brought out by Shri T. N. Singh in his minute of dissent:

> "A few lectures on spiritual and moral values and a fortnight stay in villages is not likely to bring about any radical change in the attitude of mind of our young trainee officers. My colleagues seem to forget that but for this interlude in the villages, the trainee officers will be conforming to western way of life for the whole of the training period and the rest of their lives .... I am also not in favour of creating further pools of officers. Past experience of pools like Commerical and Finance Pool and Industrial Management Pool shows that the system has never worked well though it might have given advantage to certain officials in those days. The new scheme will in practice mean creation of a new pool and interchange may not be possible between the field and the Secretariat notwithstanding such a provision in the scheme."

Certain other recommendations of the Commission which appear to be faulty may now be taken up.

Recommendation 53(2) says:

> "All supervisory officers should be empowered to suspend a subordinate officer in circumstances disclosing gross dereliction of duty, subject, however, to a review of the order of suspension within a short time by the next higher authority."

This recommendation has obviously been made on the basis of the following suggestion of the Nagarkatti Study Team[16]:

> "The power to suspend an employee pending inquiry and disciplinary action, which is now vested in many cases in a higher authority, should be vested in the immedate superior."

In actual terms, this recommendation would mean that a Deputy Secretary could place an Under Secretary under suspension, a Section

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[16] *Report of the Study Team on Promotion Policies, Conduct Rules, Discipline and Morale*, Administrative Reforms Commission, New Delhi, December, 1967.

Officer a dealing Assistant, a Superintendent of a District Office his Finance Clerk, a Tehsildar his Naib-Tehsildar and so on; the immediate superior officer himself being the judge whether a gross dereliction of duty has occurred. The short time within which he has to report to the higher authority has not been indicated; in any case, when the higher authority is presented with a *fait accompli*, he will have the painful choice of either rescinding the order of the immediate superior causing him loss of face detrimental to morale or to acquiesce in the order, notwithstanding the merits of the case. In a country where regional, caste and other social pulls are extensively prevalent, a provision of this nature would indeed create chaotic conditions in the administrative set-up.

Two other recommendations of the Commission taken together create an unenviable situation. Recommendation 59(1) states:

> "A civil servant may be allowed to retire voluntarily after he has completed 15 years of service and given proportionate pension and gratuity."

Recommendation 62(2) reads:

> "The restrictions which now operate on the acceptance of commercial and other employments by retired personnel during a period of two years after retirement may be removed or approval of such appointments given as a matter of course. This should, however, be subject to the following conditions:
>
> If the salary received in the new employment, together with the pension, exceeds the last pay drawn, the pension will be withheld in part or *in toto* as may be necessary."

Taken together, these recommendations will lead to a heavy migration of government servants to private sector at an age when they would have acquired sufficient experience and could render useful service for a fairly long period. On the one hand, the Commission advocate diverse types of training programmes for civil servants at all levels, which, it has to be remembered, involve investment of public funds. On the other, they provide easy facility for migration to private sector at a time when the officer would have been of maximum use to Government as a consequence of such investment. If these recommendations are implemented, government would be reduced to the status of a nursery for grooming officers for the private sector. The pension reduction provision stipulated by the Commission will not be able to arrest this

migration because after an officer finishes his employment in the private sector, his pension would be automatically resumed in full.

The Commission's proposal that while Union Public Service Commission ought to be associated with the selection of officers for the middle management level (both in the Departmental Promotion Committees as well as where a written examination is contemplated), but should be excluded from the selections for senior management posts, militates against the constitutional status which has been provided to the Union Public Service Commission. It may be understandable to confine the Union Public Service Commission to recruitment at the initial entry level; however, if they are associated with promotions from grade to grade, it would be difficult to prove that while their association is an asset at the middle management levels, it is a liability for the senior management posts, where selection has been left to a committee of civil servants alone.

It is also necessary to state the major omissions in the Commission's Report. There are four major inadequacies:

(1) Failure to process the recommendations in the light of the current situation of Centre-State relations: The Centre-State relations at the time of the publication of the Commission's Report have shown new types of strains and considerable thought is being given to the problem of keeping them on a healthy and co-operative keel. At this juncture, the Commission propound a personnel plan in which more and more of top Union jobs will go to the people who have no experience of working with the State Governments. The tenure system implying rotation between the States and the Centre had the virtue of staffing both the Union and the State Governments with officers who were drawn from the same tradition, had more or less similar outlook on administrative problems and understood each other's language, viewpoint and reactions. This infrastructure of servicemen, among whom dialogue was easy and fruitful, to a large extent, eased the burdens of the political leaders in the Union and the States to maintain a constructive viewpoint on problems of national magnitude. This was also the reason why two separate Services for the Union and the States were never seriously considered in India, although they had existed in other Federations like the United States. Indeed, if one could, in emulation of Professor Parkinson, propound a law on cordial Union-State relations in India, it would be:

"the deterioration of friendly and cordial relations between the Union and the States in India shall be directly proportional to

(*a*) the increase in political distance between the party ruling at

the Centre and in a given State (uncontrollable part);

(*b*) decrease in the manning of top posts at the Union and in the State Governments by officers who have the experience of serving both administrations (controllable part)."

Doctrinaire and theoretical considerations apart, grounds of practical wisdom and expediency indicate that a personnel plan which increases the gulf between the States and the Union is fraught with grave consequences in our current national setting.

(2) Failure to give adequate attention to the personnel which constitutes the contact points with citizens: the major disappointment of the Report is its persistent preoccupation with the problems of Class I officers and distribution of jobs between various groups; a sphere in which average citizen can have no conspicuous interest. A citizen's main concern is the quality, behaviour and integrity of the personnel which constitutes his contact points. This personnel is mostly in Class IV and Class III Services of public employment, whose problems have not received a close attention in the Report.

In the pay plan which the Commission have devised, all that they say in respect of Class III and Class IV personnel is:

> "that Class III may have 9 to 13 grades with suitable pay scales and Class IV may have one common grade for all types of personnel."

Nearlyfor 50 per cent of the government employees, who constitute the Class IV strata of public employment, the Commission, instead of examining their problems in sufficient detail, have settled their fate by providing one grade for technical, non-technical, office and field staff. A police constable who regulates the lives of citizens, a ticket collector who makes their travel comfortable or uncomfortable, a village patwari who provides them or deprives them of agrarian peace, a gram sewak who stimulates them for developmental work and a number of such other officials who impinge on the daily lives of citizens have not received sufficient attention from the Commission. In one of the Conferences at the Indian Institute of Public Administration, the Union Home Minister, Shri Y. B. Chavan, had stated:

> "It is at the lowest level that the image of the entire administration is either made or marred. The behaviour of a village accountant, a forest guard, a police constable, a gram sewak and a village school teacher does more to shape the attitude

of the masses towards government than the behavioural patterns at the Union or State headquarters."

One wishes that this class of functionaries and their problems had received better attention.

(3) Failure to deal with the falling attractiveness of public employment.

It is a well known fact that public employment at all levels is becoming less and less attractive and there is a shift of talent, both technical and non-technical, towards the private sector. There can be two possible approaches to counteract this tendency:

(*a*) either on the lines of the recommendations of the Patil Study Team, a national pay policy may be evolved which restricts the emoluments in the private sector to comparable levels with public employment, or

(*b*) the pay scales in Government may be raised sufficiently to continue to draw talent in a highly competitive market.

A formula which envisages socialism for the public services and market value for the private sector, is bound to operate heavily in favour of the latter and the public services would be progressively starved of talent. This would be a damaging development in a Welfare State where a conspicuous role is assigned to the public sector. The Commission's solution for this problem, which is essentially one of demand and supply, is indeed ethereal. They state:

"The sort of mentality which avidly seeks to contrast the financial prospects of the Civil Service with the more lucrative opportunities of commercial employment is not the one on which we can depend for the realization of the social and economic goals of the nation. The urge to work for a cause higher than oneself and the consciousness of serving noble ends can generate energies which can transcend and vanquish material handicaps. The young men and women who are selected for the Services should be made to feel that the opportunity to participate in the nation building enterprise is in itself a valued privilege and a means of self-fulfilment. Such a view of one's vocation at once humble and lofty can be maintained only when one's efforts are grounded on a firm spiritual foundation. The strengthening of ethical and spiritual base for high human

endeavour should be the most important of the responsibilities of the trainers."

It is not clear how, when diversion of talent has already taken place prior to the selection in the public services, the above noble sentiments at the training stage would be of any value in attracting the right quality of recruits. In the competitive employment market, the lure of the spiritual would be a poor substitute for better material prospects, particularly to the age groups who are seeking employment.

(4) Failure to deal with the problem of administrative apoplexy at the Centre and anaemia at the extremities.

One major flaw in the administrative landscape of India is the diminishing attractiveness of field jobs. There is a concentration of better personnel in the Union and State Secretariats, offices of the functional heads of departments and head offices of public enterprises or corporations. The lure of urban living, better education for children, better prospects of promotion and better emoluments is causing a migration from the periphery to the nodes. The Patil Study Team has drawn attention to the fact that jobs at headquarters even of a minor nature are created in higher scales, so that functionaries with limited responsibilities draw higher salaries in comparison with officers in the field who are managing a much bigger chunk of administrative activity. In their words:

"Salary differentials tend to be inversely proportional with the distance of a post or a cadre from the centre of authority, be it Delhi in the case of Central Government, State capitals in the State Governments or company headquarters in the case of public undertakings. There is yet another genre of anomalies which has arisen as a result of salary determination following some so called "modern" ideas. In this process, a large category of humble officials, specially those performing traditional functions are forgotten. The burden on the exchequer goes on increasing and whenever their case is considered, it is lost in the enormity of big issue. These Services cannot form a pressure group, nor can they catch the public eye—which the newer and more 'glamorous' departments can easily do. We are referring here to the traditional departments like Police and Revenue which form the infrastructure for the entire national, political and economic activity, yet in the more 'important' day-to-day discussions, are often in the background. The lowest responsible officials of

these departments who come in touch with the public very intimately are the Sub Inspectors of Police and Naib Tehsildars of the the Revenue Departments. The salary scales attached in many States to the post of Sub Inspector are in the neighbourhood of Rs. 150-250. On the other hand, quite a few new departments have arisen and in their hierarchies, persons with much less responsibilities have been treated more liberally. Sectoral approaches to the problem disturb the entire balance and the chances of restoration of the balance recede .... The most harmful effect of imbalance in pay structure is the misutilization of personnel. Those organizations which are able to create higher positions tend to utilize high level talent for jobs which can be equally well, perhaps better, performed by persons in lower grades. In Government of India, one can find qualified engineers doing file work, highly qualified medical doctors joining lower positions simply because they carry higher emoluments and qualified educationists, for the same reason, occupying a niche in a Ministry requiring just average calibre; agricultural scientist may be attracted to headquarters organizations for doing routine paper work, leaving important field positions."

There cannot be two views that this trend has to be reversed and it was expected that the Commission would give concrete suggestions for making field posts attractive and starting a reverse migration.

The Report also leaves many unanswered questions. To take, for example, the Policy and Management Pool, it is not stated how the reversion from the non-functional specialisms after the six years' tenure can be effected. Since the Pool is to be recruited through a competition, a certain rivalry is bound to be generated between those who succeed and the others who are left in the functional departments. Normally, the left-overs, in a period of six years, would have risen in their functional hierarchy and when a Pool officer becomes due for reversion, it is not clear at what exact level he will be inducted in his parent functional organization. Obviously, he cannot be inducted at the level to which his contemporaries have risen in the functional hierarchy because he was never tested for functional promotion and, in any case, he would be out of touch with that type of work for nearly six years. If he goes back to the level from which he was selected for the Policy and Management Pool, he will face the spectacle of his rivals having risen through the functional ladder and he reverting to the original position. The upshot would be that Pool officers would literally dread to go back to their parent functional departments.

It is also not understood how the recruitment to the Pool vacancies in a certain year would be dovetailed with the background of the recruits who succeed in the written examination. For example, it is conceivable that 8 posts might fall vacant due to normal wastage in a certain year in the Policy and Management jobs in the Ministry of Home Affairs, Ministry of Defence and the Department of Community Development. The 8 persons succeeding in the written examination may be from the functional areas of Income-tax, medical profession and the Postal Services. The result would be that these persons will have to be posted in the Ministries of Home Affairs and Defence and the Department of Community Development and all that will qualify them for these Ministries would be a short training they would have received after their selection in the related specialisms. One cannot conceive of a worse type of generalism creeping into the Central Secretariat. It would be far worse than the present position where one frequently finds a Postal Officer serving in the Ministry of Works and Housing or an Income-tax Officer in the Ministry of Defence. Secondly, it is not clear what was the difficulty in rotating the officers at the senior management level, both functional and non-functional, with the States where in an almost identical secretariat structure, similar jobs could be found in many of the functional and non-functional areas. In actual practice, what Shri T. N. Singh anticipates, in his minute of dissent, would happen; people in the Policy and Management Pool, by the time their six years of tenure is over, would be looking forward and pressurising for absorption at the senior management levels. Since there is no fixed tenure at the senior management level, some of them will spend the rest of their careers in the Secretariat. The State Governments and the functional departments would become nurseries to train officers up to the seniority level of 8-12 years and thereafter, the best of them will migrate to these comfortable Pools and spend the rest of their service lives at the headquarters of the Union Government. The damage that will accrue by such a pattern is for anybody to see.

(V) AN ALTERNATIVE PERSONNEL MODEL AND NECESSARY STEPS

In the light of the observations made above, the personnel structure suggested by the commission would be unworkable and deficient to meet the requirements of the current national environment. In conclusion, an alternative model is suggested alongwith the steps to be taken.

While structuring this model, the following assumptions have

been accepted:

(*a*) The standards of the candidates recruited to the Indian Administrative Service are progressively falling and this situation has to be remedied;

(*b*) In spite of the very rigorous competition for the Indian Administrative Service, the possibility of comparable talent residing in other sectors of public employment cannot be ruled out;

(*c*) In spite of a relatively high competence of the Indian Administrative Service as professional administrators, there is need for greater specialisation of this Service into certain broad areas; and

(*d*) There is need for large scale position classification at all levels of public employment to determine afresh the qualifications, the responsibilities and remunerations for various jobs.

Consistent with the above requirements, the alternative model and the necessary steps would be as follows:

(1) The Indian Administrative Service should be recognised and groomed to be the sole corps of professional administrators to man all the Secretariat posts at the Union and the State headquarters at and above the level of Deputy Secretaries. These posts should accordingly be encadred in the Service. (The Secretariat posts are intended to include only Deputy Secretaries, Joint Secretaries, Additional Secretaries and Secretaries. They do not include the posts of certain advisers or officers on special duty or consultants, which may be recruited from other sources also, depending upon the nature of the job.)

(2) The posts of Under Secretaries, both in the Union Government and the States, should be filled by the corresponding Secretariat Services by promotion. The initial recruitment for the Secretariat Services, both in the Union and States, should be at the level of Assistants, so that progression to the posts of Under Secretaries would involve two promotions, first to the level of Superintendents/Section Officers and then to the level of Under Secretaries. This would ensure that at the level of Under Secretaries, fairly experienced officers in the Central Services would be available, to perform procedural and memory functions.

(3) The examination for the Indian Administrative Service should be conducted in regional languages to cast a wide net for inducting

talent. At the moment, out of over a lakh or so graduates, coming out from Universities, so few are fluent in the English language that in spite of the high intellectual calibre which some of them may possess, they cannot hope to succeed in the examination. The moment examinations are held in the regional languages, much higher talent will come into the Service.

(4) To induct greater talent in the Indian Administrative Service from all possible sources, there should be two methods of recruitment. Method I should continue to be the present one with certain other subjects added for choice in order to cater to a wider section of candidates. In addition, there should be a Method II examination for filling up 50 per cent of the senior duty posts in the Service. The present State Service Promotion quota of 25 per cent of the senior duty posts and the present Ex-Servicemen quota of 20 per cent of the direct recruitment vacancies of a year, should be merged in the 50 per cent senior duty posts to be earmarked for the Method II examination. This method should be more or less on the lines of the Method II examination for the British Administrative class and should be open for all Government servants at any level, between the age group of 25-35 with not more than two chances available. After selection, the candidates should be trained for 6 months in the National Academy of Administration and for one year in a district; thereafter, they should hold charge of a Sub Division for at least 1½ years and of a district for at least 2 years. Since the maximum age of recruitment by Method II would be 35, by the time the recruits are 40, they would have covered the basic field experience which a regular recruit undergoes and for the next 18 years of their service, would be available for senior jobs at par with regular recruits.

The main advantages of this method of recruitment would be as follows:

(*a*) Members of different Services who have an inclination for administrative jobs, would be able to switch over from their uni-functional occupations.

(*b*) On the basis of the present cadre strength, the annual recruitment quota by Method II would be about 30 recruits per year and in view of the wide net cast, extremely good talent should be forthcoming. Similarly, the annual direct recruitment quota for Method I would also not exceed beyond 70 posts and, here again, better talent would be available, particularly when examinations are in regional languages.

(*c*) The merger of the State Promotion quota in the Method II examination would ensure that relatively young officers from the State Services will get into the Indian Administrative Service. Experience has shown that promotion of State Service officers at the fag end of their careers is not very useful.

In short, the Method II examination in the form suggested would, while on the one hand, provide opportunities for the talent in uni-functional, State and other Services to enter the higher administrative service, would also ensure, on the other, that these recruits go through the basic field experience, which they cannot possess unless they enter the Indian Administrative Service. The syllabus for Method II examination should be devised carefully to include papers to test the candidates' inclinations for administrative and managerial jobs.

(5) The common examination for the recruitment of the Indian Administrative Service and the other uni-functional Services should be abolished. There should be a separate examination for each uni-functional Service and its syllabus should be devised on the principle of relevance. For instance, the Indian Foreign Service examination should vest specialized knowledge in Diplomacy, International Relations and International Law; for Indian Audit and Accounts Service, there should be a preference for Chartered Accountants or other accountancy qualifications; an Income-tax recruit should possess substantive knowledge of the Income-Tax Law as also the Civil Law; and for the IPS, the examination should be modelled more on the Army pattern with an emphasis on physical qualities along with intellectual attainments. A paper on criminology could also form part of the syllabus of the IPS examination.

The advantage of recruitment for these Services with an emphasis on relevance would be that as they are uni-functional in character, professional expertise developed prior to recruitment would be an asset and long post-entry training programmes may not be needed. The present position with the Combined examination for many Class I Services has become slightly farcical; a candidate does not know what career he is aiming at. At best, he is taking a chance to get 'stuck up' somewhere or the else.

(6) The foundational course in the National Academy of Administration should be abolished. There is force in the Commission's observation:

"The important objective aimed at in providing a common foundational course is the promotion of a feeling of oneness among

the different Class I Services. Opinion, however, differs about the success achieved in realizing this objective. According to some, the foundational course tends to accentuate rather than mitigate a feeling of separateness among the Services."

One important reason for this feeling of separateness has been that members of other Services are permitted to sit again for the IAS examination in the Academy. This produces in them a notion that they are a class below the regular IAS recruits and are trying to reach that level through the examination. These psychological barriers defeat the purpose of the foundational course. It would be better if the basic foundational knowledge given in the Academy is incorporated in the courses of the other Services in their respective training institutions.

(7) The National Academy of Administration should, in the changed pattern, concentrate on the training of:

(*a*) the regular recruits of the IAS,

(*b*) the Method II recruits of the IAS for whom training programmes will have to be carefully evolved,

(*c*) refresher courses for the IAS,

(*d*) specialization courses for the IAS, and

(*e*) short duration programmes for officers of the level of Joint Secretaries and above.

Although the Commission have recommended that specialized training programmes should be farmed out to certain other institutions, there would be a distinct advantage if the Academy developed these courses. Its area of activity would increase both in volume and diversity and it will become a truly national institution.

(8) The areas for increased specialization within the IAS (now recruited in a broad-based manner) should be carefully explored. In this connection, the following observation of the Setalvad Study Team[17] is relevant:

"What these broad fields of related subjects should be, and how exactly the development of officers in them is to be organized is a question of judgment. Perhaps the entire field of administration could be classified into four main areas of specialization, namely, (*a*) personnel administration, (*b*) financial administration (*c*)

[17] Report of the Study Team on Centre-State Relationships, *op. cit.*

general or regulatory administration (*i.e.*, law and order, revenue) and (*d*) development administration, with sub-specializations like agricultural administration, economic administration, administration for social services, etc., under this group. In allocating actual posts to one or the other group there may be some overlap, especially between categories (*c*) and (*d*). Categorization may also be possible on different lines and the one given here is merely suggestive. The important thing is to decide upon some classification and frame a policy of developing specialization. This principle of specialization, as far as possible, should also be observed when an officer comes on deputation to the Central Government and deployment procedures within the Central Government should be fashioned accordingly."

As mentioned by the Setalvad Team, any *a priori* approach might not be fruitful and detailed analysis of various jobs and functions in the Secretariat would be necessary.

(9) The Central Personnel Agency should initiate studies to analyse job-contents at all levels of public employment with a view to determine their qualifications, responsibilities, predominantly functional or administrative character, and the need for allocating them to Service structures or isolated recruitment categories. The rates at which these jobs should be remunerated would obviously flow from these detailed studies. This would be a long-term process and cooperation of States and other agencies is necessary. However, the time factor should not act as a damper to induce either a hasty *ad hoc* solution or an inverted position classification which begins from the top and moves downwards.

(10) Tenures in the IAS must be rigidly enforced at all levels because rotation with the States and with the field is the main king-pin of the IAS arch. No difficulty in rotation is envisaged even with the contemplated specialization because similar jobs would be available in the State Governments where a particular expertise could be equally useful. In order to arrest the tendency of defeating tenure system by various sorts of pressures, the regulations of the Service should include a provision to the effect that pensionary benefits shall not accrue unless one-third of the total career of an IAS officer is spent in the State of his allotment. There should be another provision in the regulations to the effect that no IAS officer can be promoted to a Selection Grade post or above unless he has held charge of a district for a minimum period of two years.

(11) It is necessary to initiate immediate steps for the levelling up of emoluments in the private sector and public employment. This can be done either by evolving a national pay policy which would restrict the emoluments in the private sector or the salaries in public employment will have to be increased further. There is no third method of arresting the migration of talent towards the private sector.

(12) In view of the general shortage of technicians and specialists, efforts should be made to make uni-functional jobs attractive to prevent the rush for administrative posts. If the position classification advocated above establishes that some of these jobs carry equal responsibilities to corresponding administrative positions, there should be no hesitation in remunerating them identically. However, such enhancement cannot precede, but has to follow the comprehensive position classification.

(13) In order to provide inducement to the senior officers for going back to the field, it may be accepted that after a certain seniority, an official should carry his salary wherever he goes; the underlying assumption being that it is not the job that is remunerated, but the expertise which the officer has developed. There are a number of vocations in which it is the quality of the person which is the factor in remuneration and not the job which he is doing. If one wishes to engage a top lawyer of the Supreme Court, he will have to pay a certain fee irrespective of whether the lawyer is engaged for a murder case or a street affray. Similarly, a top medical practitioner has to be paid a high fee whether he is called for consultation in an heart attack or a seasonal fever. In the same way, a fairly senior officer, who is an expert in public administration, should not be grudged his high emoluments whether he goes back as a Commissioner of a Division or to the State headquarters, the presumption being that his expertise is going to make a substantial difference in the quality of performance.

(14) It should be ensured that the total IAS cadre is stabilized round about 3,000, which is its present strength, and the periodical studies should not only be to encadre new posts but also to decadre posts which can be suitably manned by the senior officers of the State Services in suitable Selection Grade positions. This approach, apart from preventing imbalances within the cadre between lower and higher positions, would also, on the other hand, provide suitable avenues of promotion to those State Service officers who could not succeed in the Method II examination envisaged earlier. In fact, each State should have a number of posts in the Selection Grade of the State Services with almost similar responsibilities as the senior scale posts of the IAS.

(15) More purposive steps should be taken in the direction of Career Management and Career Development within the IAS. Correct placements would be the crux of the whole scheme and all professionalization will be wasted if postings are erratic and unrelated to previous experience.

(16) The personnel problems at the Class III and Class IV levels, which in many offices constitute the contact points of citizens, can no longer be ignored. In the Central Personnel Agency, there should be a regular wing which should attend exclusively to the personnel problems of these groups.

ADMINISTERING THE URBAN FRINGE

Mohit Bhattacharya

THE structure, spread and functions of the urban fringe are often studied by the geographers. Our substantive concern here is the administration of the fringe area. Since the spatial dimension of the fringe would determine the nature of its administrative problems we may be permitted to trespass into the geographers' domain. Concepts like "urban influence area" and "region" have wider connotation, the extent of the area or region being measured on the basis of certain indices. Also the delineation depends very much on the needs or purposes which the delineator has in mind. In a study of the functional zones and the urban spread of the Mysore towns, V.L.S. Prakasa Rao has used the words "peri-urban land" and "fringe area" interchangeably.[1] His *assumption* is that the peri-urban land lies within two to three miles from the existing town boundary. Of course, he agrees that this usual spread may not be true in the case of cities passing through explosive phase of spread and where the spread is interrupted by local terrain. Although Ellefsen[2] uses the word "hinterland" which is a broader concept his conclusion is that even the hinterland of Indian cities is very much restricted as compared to Western city hinterland. When we talk of the fringe area from the standpoint of local administration we have in mind a particularly problematic area quite close to a given city boundary, which has over the years grown in such a fashion that it is for all practical purposes an integral part of the core city; yet it lies beyond the administrative jurisdiction of the city and is administered locally by the panchayati raj bodies. So the fringe area for our purposes is a transitional or twilight zone situated in-between well-recognized land uses of the city and the agricultural tracts of the village. It is, generally speaking, smaller than the commuting or trade area of a city, and can be distinguished in terms of peculiarity of land uses. In fact, most of the land uses in the fringe area are in a flux where industries, residential quarters, commercial places, streets, drains, shacks and slums jostle in space.

Admittedly, every town or city has a fringe, narrow or wide. This is also proved by the study of Rao. As he points out, "encroachment seems inevitable whether in a small town with slow growth like

[1] V. L. S. Prakasa Rao, *Mysore Towns*, Indian Statistical Institute, Calcutta, 1964.

[2] Richard A. Ellefsen, "City-Hinterland Relationships in India", *India's Urban Future*, Roy Turner (ed.), University of California, 1962.

Talakad or rapidly growing towns like Chikballapur, Mandya and Gadag." Not every fringe, however, can be considered as a problem fringe. Really speaking, the phenomenon of *problem fringe* is usually to be seen around growing towns and big cities. Instances are not rare where to avert the fringe problem the peripheral rural tract has been annexed by the core city thereby internalising the problem temporarily. Poona and Kanpur, and a few other municipal towns present this kind of situation. Delhi has about 300 villages within its jurisdiction, but it can be treated as a unique case where the boundaries of a Union Territory coincide with those of an urban local authority. In most cases, the fringe area becomes a problem area for the core city because of its location right at the periphery of the city. This area is marked by haphazard and unregulated growth, overcrowding, slums, ribbon development and traffic problems, insanitary conditions and chaotic uses of land. The fringe area, whenever discussed, is looked at as extended city area. The unregulated and haphazard developments and the insanitary conditions in the fringe adversely affect the core city. Free movement between the fringe and the city places the city at a disadvantage. Its services and amenities are freely used by the residents of the former without caring to pay anything to the municipal coffer. Thus, the fringe is looked at as the Mecca of the tax-dodgers. Since the restricted legal jurisdiction of the core city does not allow of municipal intervention beyond the boundary, various methods have been adopted or suggested to deal with this problem.

METHODS ADOPTED

(1) *Annexation*: Outright inclusion of the fringe within the city boundary is a widely known solution, and in cities like Poona, Kanpur and Howrah this method has actually been adopted.

(2) *Extra-territorial Power of Local Authority*: The core city has been given in some places statutory authority to undertake planning and building regulations in the areas close to its boundary. Under the Uttar Pradesh Nagar Mahapalika Adhiniyam, 1959 the municipal corporations have been authorized to undertake these functions within two miles of the legal limits.[3] A similar measure is the Chandigarh Periphery Control Act, 1953, under which an area within five miles on all sides of the Chandigarh boundary has been declared as "controlled area" where land use is decided strictly in accordance with the provisions of a periphery land use plan. A kindred measure is the Madhya Pradesh Town

[3] A United Nations Seminar Report contains a similar suggestion. See *Public Administration Problems of New and Rapidly Growing Towns in Asia*, Technical Assistance Programme, United Nations, New York, 1962, p. 12.

Periphery Control Act, 1960 under which the District Collector has power to declare an area of seven miles on all sides from the outer boundary of the town as a control area for regulating construction and development.

(3) *Notified Area Authority*: To deal with the fringe areas some States have set up specially constituted local authorities. For example, under the Bihar and Orissa Municipal Act, 1922, notified area committees have been set up in Jamshedpur and Jugsalai (Bihar). These committees consist of State Government nominees and function as *de facto* municipal bodies. Similarly, in West Bengal the Bengal Municipal Act, 1932 provides for the establishment of notified area authorities for administering the following areas:

(*a*) any area not fulfilling the conditions for being constituted as a municipality,

(*b*) any area which falls within a newly developing town, or

(*c*) any area in which new industries have been or are being established.

In West Bengal, notified area authorities have been set up at Kalyani within the Calcutta Metropolitan District and at Durgapur which is a growing urban centre.

(4) *Special Controlling Authority*: Another measure of special nature is the Uttar Pradesh Regulation of Building Operations Act, 1958, under which the State Government can constitute a controlling authority for a regulated area in order to prevent in that area bad laying out of land, haphazard erection of buildings and growth of substandard colonies, or to develop and expand the area according to proper plan. The authority is to consist of not more than nine members with the Secretary, Local Self-Government Department or the Divisional Commissioner or any other officer not below the rank of a Sub-Divisional Magistrate as Chairman. Other members to be nominated by the State Government may be the chairman of the zila parishad and the president of the municipality or notified area situated within the regulated area. There is also provision for co-option of other presidents of local bodies in case these fall within the regulated area. In West Bengal, the Calcutta Metropolitan Planning Area (Use and Development of Land) Controls Act, 1965, is intended to serve the same purpose. Under Section 3 of the Act, the State Government may declare an area to be a controlled area for which it may issue directions concerning the use of land, the division of any site into areas for the erection of

buildings, the allotment or reservation of land for services or utilities, excavation, access to roads, and any other matters necessary for orderly development. The State Government may appoint a Land Use Controller to enforce these directions, or delegate powers to existing agencies, such as District Officers or the Chief Executive Officers of local authorities.

Apart from these, there are also few instances of joint committees of urban and rural local bodies to solve specific problems.

METHODS SUGGESTED

In recent times at least two high-power central committees have paid attention to this problem of unregulated and haphazard urban growth beyond the municipal boundary. One is the Committee on Urban Land Policy which submitted its report in 1965, and the other is the Rural-Urban Relationship Committee which submitted its report a year after. The first Committee suggested[4] that a way out of the type of difficulties created by haphazard and unregulated urban growth might be to create a high-power statutory autonomous urban development board or authority at the state level which will have the power of compulsory public acquisition of land. In its opinion, the board should have a whole-time chairman, and two or three whole-time members to deal with financial, engineering and administrative matters. Senior officers of the concerned State departments including the Local Self-Government Department, State Town Planning Department and the State Public Works Department, and one or two members of Parliament, State Legislatures or Local Authorities should be taken in as members of the board. The principal executive head of this board should be vested with sufficient financial and executive powers. As regards functions, it is suggested that the board would guide and advise the State Government, the urban local bodies and other agencies in matters pertaining to urbanization and urban planning and development. It will act as the coordinating agency for planning and development and enforce the plans prepared by it with a view to securing integrated and coordinated planning and development. The board may also undertake the implementation of various development schemes itself. It might have to set up operating units in the areas where it has to work. To ensure inter-agency collaboration and coordination at the local level the board may have a local advisory committee in the operating areas consisting of representatives of the urban local bodies, development agencies and other major interests. Where no

[4] *Report of the Committee on Urban Land Policy,* Ministry of Health, Government of India, New Delhi, 1965, pp. 29, 52-54.

operating units can be set up, the board may entrust the urban development functions to a suitable local agency, such as the Improvement Trust or any other authority. Thus, the Committee on Urban Land Policy recommends a multi-functional board at the State level which may or may not have local operating units of its own. Planning and development of fringe areas would be one of its functions, but it is not exclusively meant to take care of these areas.

The Rural-Urban Relationship Committee, as the title suggests, is more intimately concerned with the governmental problems beyond municipal boundaries. This Committee has discussed in detail the problems of unregulated urbanization. To quote from its Report, "The urban process cannot stop at the edge of the municipal limits. In fact, most of the problems of urbanization relate to haphazard growth and development in areas that lie within the administrative jurisdiction of Panchayati Raj Bodies." The solution offered by this Committee is quite ingenious.[5] Except for metropolitan and industrial complexes, the district, in its opinion, must be accepted as the regional administrative unit for the purposes of planning and development within the framework of a comprehensive planning legislation. The districts have been divided into two broad categories: (*a*) those with substantial urban population, and (*b*) others which are predominantly rural. For the district with substantial urban population a statutory planning and development authority at the district level has been suggested. The members of this authority would include the District Magistrate, the president or chairman or mayor of major cantonment boards, municipalities and corporations within the district, the chairman and two other members of the zila parishad of the district and representatives of special interests like railways, etc. For the predominantly rural district no statutory authority has been recommended. Instead a special committee has been suggested consisting of representatives of urban and rural local bodies and other special interests within the district. The chairman of the involved zila parishad will preside over this committee.

For metropolitan areas and industrial complexes a separate planning and development authority has been recommended. The State Minister of Local Self-Government or Urban Development should be the Chairman of the authority, which would consist of the representatives of zila parishads, major municipal authorities and other important interests within the metropolitan area. The authority, it is suggested, should have a senior officer as its executive head who would be assisted by technical members in charge of planning, engineering and finance.

[5] *Report of the Rural-Urban Relationship Committee* (Vol. I), Ministry of Health and Family Planning, Government of India, 1966, pp. 43-44, 52-53.

So far as the special committee for the predominantly rural district is concerned, it is to be assisted by the State Government in drawing up regional plans and their implementation. But in the two other cases, the special statutory planning and development authorities should have sufficient powers and resources to prepare regional plans and ensure their implementation, to coordinate the activities of different agencies, and to operate in respect of land acquisition, development and disposal and other important area-wide functions. Wherever possible, the urban and rural local bodies would prepare detailed local plans in accordance with the guidelines laid down by the statutory planning and development authority. For metropolitan areas the creation of a single municipal government covering the entire region has also been recommended as an alternative.

Recently, in the *Basic Development Plan*[6] for the Calcutta Metropolitan District it has been suggested that special development authorities should be set up to undertake planned development of both municipal and non-municipal areas falling within the Metropolitan District. The latter constitute about sixty per cent of the total area of the Metropolitan District and contain nearly fifteen per cent of its population. Three such authorities recommended are the East Bank Development Authority, the West Bank Development Authority and the Kalyani-Bansberia Development Authority. The first two would replace the existing two Improvement Trusts of Calcutta and Howrah. Essentially these authorities would be in the nature of Improvement Trusts and their main functions would be to undertake urban renewal, area development, new township development and local planning within the framework of a metroplitan plan.

THE PROBLEM RECONSIDERED

The methods so far adopted and suggested to contain and regulate fringe growth point out that this problem has not gone unnoticed. Before examining them, some basic considerations need to be kept in mind. In the first place, one cannot overlook the fact that our local government which has to bear the brunt of urbanization is ill-equipped to undertake this responsibility. Although the urban local bodies are somewhat better off, many of these have within their boundaries haphazard and unplanned developments, and even the basic urban services, such as water supply, drainage and sewerage, roads, and medical and health facilities, are awfully poor in many of them. Often

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[6] *Basic Development Plan for the Calcutta Metropolitan District* (1966-86), Calcutta Metropolitan Planning Organisation, Government of West Bengal, 1966, pp. 127-128.

there would be hardly any marked difference between the situation within the municipal boundary and that outside it. Again, the neighbouring rural local body—a tiny gram panchayat—does not have the resources or the necessary orientation to deal with urban problems. The Panchayati Raj bodies, as they are conceived and constituted now, are basically oriented towards rural development and agricultural growth, and cannot be expected to provide an answer to urbanization and urban development. A second important consideration concerns the *degree of control* that needs to be planned to cope with haphazard fringe growth. Although the fringe areas are notorious for unregulated urbanization which is obviously annoying to a townplanner and it is always nice to have an urban area according to a master plan, a developing country like ours with sluggish rate of economic growth can hardly afford to disregard the fact that the fringe areas are also the natural growth areas. Land use controls should, therefore, be carefully planned to impose "minimal essential constraints" which would help, and not scare away, "aggressive private investment in productive activity."[7] Last, but not least, whatever methods might be adopted or suggested to tackle the problems of fringe area, one has got to take the local bodies of the area in confidence and from the long term point of view no enduring solution is possible outside the system of local government.

Turning to the methods that have been adopted and suggested from time to time to tackle fringe growth, it appears that these are classifiable into three types: (*a*) solution being within the system of local government, (*b*) solution being outside the system of local government and in special purpose bodies, and (*c*) solution being in a compromise between (*a*) and (*b*).

Municipal annexation of peripheral tracts, extra-territorial powers over the fringe areas, and joint committees belong to the first type of solution; while notified area authority, special controlling authority and the Basic Development Plan's suggested development authorities belong to the second. The methods recommended by the Committee on Urban Land Policy and the Rural-Urban Relationship Committee fall in the last category. Annexation, exercise of extra-territorial powers and joint committees serve the purpose of internalising the fringe problems. These may be useful methods in limited cases, but their acceptance as a general policy is open to question. Municipal bodies in India live a hand-to-mouth existence. It will, therefore, be ruinous for them to undertake additional responsibilities for the undeveloped problem fringe. Also the residents of the fringe are often

[7] In this respect the *Basic Development Plan for the Calcutta Metropolitan District* has laid down a reasonably cautious urban land policy, *op. cit.*, p. 134.

opposed to annexation for fear of increased taxation. Again, frin
growth is a moving phenomenon which needs to be dealt with by
sufficiently flexible tool. These methods are, however, too static to l
of any real use in a dynamic situation. This applies equally well to tl
special purpose bodies which are also area-bound. Even then, giv
adequate resources, these bodies might be useful as *stop-gap devic*
The Improvement Trusts, for example, have in many places done co
mendable work as development agencies. Once the development wo
is completed, the Trust usually hands over maintenance responsibiliti
to the municipal authority. At the same time, special authorities oft
get involved in jurisdictional conflicts with the local bodies, and th
have to depend on the State Government and the municipal authoriti
for funds.

Of the suggested measures of the two official Committees mention
earlier, the idea of a State level urban development board seems to ha
attracted little attention. Apart from the difficulty of finding resourc
for such a machinery, an important problem that this kind of propo
raises is : where to place it in the organizational set-up of Sta
Government? Rural local government and urban local government a
in many States looked after by separate departments. An urb
development board would naturally be tagged to the State departme
dealing with urban local bodies, but urban growth often cuts acr
the boundaries of local bodies, both urban and rural. Unless there
a single State level department of local government in charge of urb
and rural local bodies, it may not be easy for a functional agency li
the proposed board to operate in the peri-urban areas. Also, t
location of a State functional agency would perhaps be fruitful at t
field level and not at the State level.

The Rural-Urban Relationship Committee

In many respects the recommendations of the Rural-Urb
Relationship Committee are of monumental significance. It deser
all the praise for pioneering a sound and scientific approach to t
problems of urbanisation and urban development without being bog
down in petty institutional considerations. Urbanization, as t
Committee rightly points out, is no respecter of local boundaries; it i
mobile phenomenon which links in its trail rural and urban ar
together. One can infer from this that whatever happens in the fri
area is the localised symptom of a bigger problem whose tap roots
elsewhere. Therefore, to get a broader perspective, it is necessary
look beyond local areas into the wider region that grows out o

symbiotic relationship of the rural and urban areas. To quote from the Committee's Report:[8]

> "The process of interaction and inter-dependence between the smaller communities for the achievement of common needs and interests leads to the formation of a regional community. Such a regional community contains a central urban area and the surrounding rural areas. The boundaries of such a region would depend on the size and the complexity of the urban area. The bigger and more complex an urban area, the larger the corresponding region embracing within its boundaries rural and urban groups. All these regions, large and small, include a fairly broad spectrum of agricultural, industrial, commercial and other types of activities, all closely interrelated and requiring various common services, such as health, education, water supply, drainage, and transportation. In the region, there is a hierarchical pattern of settlements bound together in a system of functionally interlinked and interdependent units. There is thus a continuum of communities that stretches from the smallest village to the largest metropolis."

Ideally, the problem area should be coterminous with the administrative area. If the unit of rural-urban interactions is the region, it is but natural to recommend a regional administrative machinery. This is exactly what the Rural-Urban Relationship Committee has done. The upshot of the Committee's recommendation is that barring the metropolitan areas and the city region complexes having a population of more than 5 lakhs which have to be treated differently, the district should everywhere be accepted, for the sake of administrative convenience, as the regional unit for planning and development. Virtually a two-tier administrative system is envisaged with a district level special statutory planning and development authority looking after major area-wide functions and the local authorities at the bottom undertaking purely local functions.

This recommended administrative structure would eliminate chances of unregulated fringe growth, as the upper-tier authority will plan for the whole region including the peri-urban areas falling within it. Presumably, inter-regional plan coordination would be done at the State level. But once this problem of State level coordination is posed the basic weakness of the recommendations of the Rural-Urban Relationship Committee becomes apparent. If Panchayati Raj and Municipal Government are looked after at the State level by two separate departments which is the case in many States after the

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[8] *Op. cit.*, p. 41.

advent of Panchayati Raj, the idea of coordinated rural-urban develop ment at the regional level as envisaged by the Committee become difficult, if not impossible. Local government is one and indivisible, an it has to be treated as such. Any dichotomous approach at the polic level is bound to affect administration at the local and regional levels The device of a statutory planning and development authority at th district level is a purely *ad hoc* arrangement and it cannot organicall link the rural and urban local bodies together. Even now, provision fo interlocking memberships between the Panchayati Raj bodies and th municipal authorities exist in most of the Panchayati Raj Acts. Th Andhra Pradesh Municipalities Act, 1965 provides that a municipalit must send its plan schemes to the zila parishad [Sec. 34(4)]. But, al these arrangements have failed to achieve the much-needed coordinatio between urban and rural local bodies. Intergovernmental coordi nation is more desired than actually realized in practice, and it i hard to believe that the statutory planning and developmen authority with an assortment of diverse interests would have smooth sailing.

Nevertheless, the Committee's diagnosis of the administrativ malady is certainly above board and its approach to administrativ reorganization is remarkably sound. To quote from its Report:[9]

> "The vital role of administrative institutions in equalising distinc tions and differences must be recognised . . . and so long as w have one set of institutions for urban areas and another set for th rural areas, the differences will not only persist but get furthe stratified."

There cannot be a better statement of the predicament of contempo rary local government administration in India. The phenomenon o unregulated fringe is largely a concomitant of the dichotomy tha exists today between urban and rural local government institutions i the country. The urban fringe is the vanishing point of local govern ment, as it were, where municipal administration cannot reach an rural administration is at best a silent spectator. What is needed is to borrow the Committee's words, "the integration and coordinatio of the activities of the urban and rural local bodies, particularly in th field of planning and development.[10] After this, the Committee' recommendation about the statutory authority sounds inconsisten with its own approach towards the solution pattern. If integration i

[9] *Op. cit.*, p. 36.

[10] *Ibid.*, p. 43.

really the objective, this cannot be achieved through *ad hoc* arrangement; it has to be built into the very system of local government. What we have in mind is a composite form of local government embracing both urban and rural areas together, which would do away with the present-day invidious distinction between Municipal Government and Panchayati Raj. Within the framework of a single piece of local government legislation, each district could have a district-level representative body and a number of municipalities and suitably designed rural local units. To forge an organic link between the district-level body, and the local-level municipalities and the rural units, the former could be constituted by indirect representation from the latter. A scheme of functional distribution between the two levels would be governed by the principle that larger district-wide functions and those that involve more than one local unit should be undertaken by the district-level body, and the local-level functions should be entrusted to the municipalities and the rural local units. Planning, to cite an instance, would be the responsibility of the district-level body. Under this arrangement chaotic fringe development which is largely due to a governmental vacuum in the peri-urban regions, would not take place, as district planning would blanket the entire district area. Such a scheme of local government reorganization would obviously necessitate a remodelling of the contemporaneous triple-decker Panchayati Raj system of rural local government. The bigger municipal corporations have to be left out of this scheme. To forestall haphazard fringe-growth beyond their boundaries, their planning must take into account their limits of future urbanisability and seek to put a green-belt around. The green-belt is, however, an essentially negative device based on the assumption of a static urban population. Therefore, it must be supplemented by a planned policy of population dispersal through the development of new urban nucleii.

The planning of district-level bodies and bigger municipal corporations, which would remain outside the composite local government system, would have to be coordinated at the State level. Hence, the scheme of local government reorganization envisaged above must be preceded by the creation of a single, well-equipped ministry/department of local government at the State level which would do away with the present-day duality in State administration in relation to Municipal Government and Panchayati Raj institutions. Haphazard urban growth has its origin, in most cases, in faulty locational policy with regard to setting up of industry, and there is hardly any watch from the State level over unregulated urbanisation. It should be one of the functions of the ministry/department of local government to keep in constant touch with the development policy for the State as a whole so that

specific local areas selected for development could be alerted agains the possible consequences of development.[11]

CONCLUSION

The fringe being the rural-urban confluence, a discussion on it administration naturally raises fundamental questions about the concep tion of local government as a whole. During the nineteenth centur our Municipal Government grew up as an exclusive system in much th same way as Panchayati Raj was inaugurated as an exclusive pattern c rural local government ten years ago. An unhappy contradiction tha has resulted from this is that industrial and technological development are fast creating a functionally linked society, but the two mutuall exclusive systems of local government are trying to keep loca communities apart. Sooner or later, we will have to resolve thi contradiction by evolving a composite system of local government tha would fit in with the emerging pattern of society.

[11] In this connection, see Mohit Bhattacharya, "Rural Self-Government Metropolitan Calcutta", *Calcutta Research Studies No. 5*, Bombay, Asia Publishi House, 1965, Ch. 8.

DAMODAR VALLEY CORPORATION: INDIA'S EXPERIMENT WITH THE TVA MODEL*

Richard E. Hamilton

ONE American innovation which has attracted considerable interest in underdeveloped countries is the Tennessee Valley Authority. Although the experiment has never been repeated in the United States a number of river valley authorities patterned quite deliberately after the TVA have been set up elsewhere in the world.[1]

This article examines one of the earliest imitations, India's Damodar Valley Corporation. The DVC has constructed and operated a large and complex set of projects that may well have had an enormous impact on the most heavily industrialized region of the country. However, no evaluation of that impact will be made here. My intention is to look at some aspects of the DVC's history to see what light the Corporation's experience sheds on the question of the conditions under which a river valley corporation may be a suitable form of administration for river valley projects. The fact that no other river valley scheme in India has been entrusted to a corporation since the DVC was formed, and the fact that a number of important statutory functions have been taken from the DVC and given to other government agencies suggest that the experiment has not been entirely successful. It is important to see whether this conclusion is justifiable, and, if so, to find out what has gone wrong.

The TVA Model

Before looking at the DVC it will be useful to describe that concept which seems to be meant by the term "TVA Model".[2] To describe

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*This article is based on the author's doctoral dissertation entitled *The Damodar Valley Corporation : India's Experiment with the TVA Idea* (Duke University, Durham, North Carolina, 1966).

[1] Two examples, The Cauca Valley Corporation in Columbia, and the Khuzistan Development Program in Iran, are discussed briefly in : John Oliver "The Application of TVA Experience to Underdeveloped Countries" in *The Economic Impact of TVA*, John R. Moore (Ed.), Knoxville, 1967, pp. 25-40.

[2] The book which has probably best succeeded in popularizing T.V.A. ideals is D.E. Lilienthal's *TVA Democracy on the March*, New York, 1953. See also : *The Economic Impact of TVA., op. cit.* An Indian interpretation of the "TVA Model" may be found in N.C. Basu Rau Chaudhury "Problems of the Damodar Valley Corporation" in *Problems of Public Administration in India*, B. B. Mojumdar (Ed.) Patna, Bharati Bhawan, 1953.

the term, it is not necessary to make any judgement concerning ho closely the TVA has itself approximated this ideal type. The importa purpose is to attempt to identify what observers of the TVA, especial those who wish to set up imitations, conceive the TVA model to be.

The principal technical innovation on which the regional authori is based is the multi-purpose reservoir formed by constructing a da across a river. One dam may serve a number of functions each of whic would require a separate dam and reservoir if the functions were to t provided separately, as in general they were before the TVA wa established. The multi-purpose scheme may have as its primary purpo the reduction of flooding in low-lying areas below the dam. Howeve the water accumulated in the reservoir may be used to generate ele tricity, to irrigate farm lands below the dam, to provide a regular suppl of water for industrial purposes, and to maintain adequate water leve in the river below the dam for year round navigation.

In some cases there may be advantages in giving further function to the authority entrusted with the job of building and operating th dams. Examples of additional activities are: fish culture, provision c recreation services at the reservoir, promotion of agriculture in th region by research and extension programmes, soil conservatio afforestation, encouragement of small industries, rural electrificatio and public health. It may even be desirable to grant some river valle authorities comprehensive powers and responsibility for nearly a public sector economic activities in the regions where they are locate A distinction may be drawn between the 'engineering' approach accor ing to which the authority simply erects, maintains and operates th physical structures and the most comprehensive approach labelled b its proponents 'decentralized regional planning'. The TVA mod refers to the comprehensive approach. However, there exist man feasible combinations of functions between these two extremes, and on of the conclusions of this paper will be that a great deal of trouble ma ensue in cases in which the wrong combination of functions is given t a river valley authority.

Another important feature of the regional valley authority is th it is decentralized, both geographically and functionally. In the Unite States the TVA may be contrasted with the alternative approach c parcelling out various tasks in a region among a number of feder agencies with headquarters in Washington.[3] Thus, the TVA model i

[3] The TVA's head office in the Tennessee V lley in Knoxville. However, the DVC head office is outside the Damodar Valley in Calcutta. One of the oldest and mo persistent sources of friction between the DVC and the West Bengal Government based on the Corporation's desire to locate its head office within the valley.

thought to appeal not only to advocates of government planning but also to those who are anxious to reverse the tendency towards increasing centralization of government decision-making. Lastly, and most important according to David Lilienthal, is the concept of "grass roots administration". This concept refers to Lilienthal's policy of provoking and facilitating local users of TVA products to form cooperatives and other democratic organizations which would handle the retail distribution of TVA products. By this device, which an eminent sociologist maintains was an ingenious strategy which the TVA used to gain the support of local groups in its struggle for power with the above mentioned Federal agencies,[4] the Authority displayed itself as embodying the liberal idea of limited government, and at the same time furthering democracy at the local level by helping citizens of the area to form cooperatives for the retail distribution of TVA electricity and other products.

Background and Development Before 1945

The Damodar River has its source in the State of Bihar and flows 336 miles to merge with the Hooghly River in West Bengal about 30 miles below Calcutta. The Damodar Valley occupies 9,240 square miles, about one-fifth of the area of the Tennessee Valley. The principal tributary river is the Barakar which enters the Damodar from the north in West Bengal not far from the Bihar border.

Between 80 and 90 per cent of the annual rainfall, which averages 47 inches, occurs during the monsoon months from June to October. As a result of the monsoon rains the hilly terrain of the Upper Valley (that part located in Bihar) has become badly eroded and cut by deep gullies. A large portion of the lower valley (that part located in West Bengal) is overlaid with a heavy layer of fertile alluvial soil deposited by the frequent flooding of the Damodar part of the Indo-Gangetic plain before the DVC dams were built. The main crop is rice which is cultivated from June to November. The heavy seasonal concentration of rainfall does not permit dry-season cultivation without supplemental irrigation. This has not been traditionally practised in Eastern India, and irrigation techniques are new to most farmers.

The Damodar Valley and adjoining area comprise the most valuable industrial region in India. About 80 per cent of India's coal is mined there, and 98 per cent of its iron ore. Three of the country's six steel plants are located in the area and a fourth is under construction.

[4] Philip Selznick, *VTA and the Grass Roots*, Berkeley, 1953.

A number of schemes to control flooding in the Damodar Riv
had been proposed, some as early as the 1850's, but the British Gover
ment expressed no interest until a flood in July 1943 severed the Ea
India Railway and cut off the Fourteenth Army in Burma from
headquarters and supply sources. On the recommendation of t
Bengal Flood Enquiry Committee that a multipurpose scheme simi
to the TVA be undertaken, the Viceroy, Lord Wavell, made arran
ments in 1944 for a TVA engineer to visit India and plan a system
dams to harness the Damodar River.[5]

Voorduin's Plan

The engineer, W. L. Voorduin, completed his plan in July 194
But he had few data on which to base it. Stream flow records of t
Damodar go back to 1901, but had been taken at one place on
Rhondia, and readings prior to 1932 were not considered reliab
Rainfall records go back to 1891. A peak flow of 650,000 cubic f
per second (cusecs) had been reported twice, in August 1913 and Aug
1935. The worst storm recorded in the Damodar Valley was the Aug
1913 storm which dropped 11·9 inches of rainfall in five days. Howev
Mr. Voorduin discovered that in 1917 in the neighbouring Sone Valle
rainfall of 18 inches had occurred in seven days and he was afraid th
such a storm could center over the Damodar Valley as well. W
this consideration in mind he decided that the Damodar storage syst
would require a design capacity to regulate the run-off from a 20 in
rainfall which, if it followed the pattern of the 1913 flood, would caus
peak flow of approximately 1,000,000 cusecs.

A major problem was the selection of dam sites. Because of t
topography of the region it was impossible to locate a dam with adequa
storage capacity below the confluence of the Barakar with the Damod
River.[7] Mr. Voorduin proposed two main dams to be as near t
confluence as possible, Maithon on the Barakar, and Sanolapur (la
rejected in favour of Panchet Hill a few miles away) on the Damod
River. Six other sites were selected because of their large stora
capacity, the extent of the drainage area they would control, and th

[5] For a more detailed account of the background up to 1945 see Henry C. Hart, N
India's Rivers, Calcutta, 1956.

[6] *Preliminary Memorandum on the Unified Development of the Damodar River.* T
was made public only in abridged form, and not until 1948. The following discuss
is taken from the abridged form. (Damodar Valley Corporation, Calcutta, 1948).

[7] The drainage area of 1,540 square miles below the confluence is sufficiently large
cause a flood if very large storms were to center over it. The flood damage from such
storm could be reduced by measures to increase the holding capacity of the river
building up the banks, but Mr. Voorduin's plan assigned only secondary priority to s
measures.

avoidance of coal fields. Two of these, Deolbari and Tilaiya, were on the Barakar River, one, Aiyar, was on the Damodar, and two, Bokaro and Konar, were on the Bokaro and Konar Rivers respectively, both tributaries of the Damodar.[8]

The reservoir capacity of these eight dams would provide 2,900,000 acre feet of controlled flood storage and 500,000 acre feet of uncontrolled storage above the top of gates, enough if fully used and correctly timed to reduce a flood caused by a seven day 20 inch storm to a relatively safe flow of 250,000 cusecs in the Lower Valley.

On the basis of estimates of the expected pattern of inflows into the reservoirs which he worked out from stream flow data, and on the basis of a set of instructions which he drew up for reservoir operations, Mr. Voorduin calculated that the reservoir system could control water flows in such a way as to irrigate 960,000 acres in the Lower Valley during the monsoon season, and 760,000 acres during the dry season.[9] A part of the plan, therefore, was to build a network of canals and channels to irrigate those acreages and to construct a barrage across the Damodar River between Burdwan and the confluence of the Damodar and Barakar Rivers to divert water into the irrigation canals. In addition, water passing through the dams could be used to generate hydroelectricity. Hence Mr. Voorduin proposed the installation of eight hydro power stations, one at each dam, with an aggregate capacity of 200 megawatts (MW). Then, arguing that a system consisting of thermal plants as well as hydro stations could produce electricity at lower cost than a system limited to hydro-stations, he recommended the establishment of a thermal generating plant with a generating capacity of 150 MW. Mr. Voorduin speculated that it might be possible for one of the main irrigation canals on the Left Bank of the Damodar River to be used for navigation purposes to reach the Hooghly. A number of subsidiary activities were proposed including domestic water supply, malaria control, silt and erosion control and introduction of fish.

In concluding his *Preliminary Memorandum,* Mr. Voorduin recommended that the Damodar Project be entrusted to an authority similar to the TVA, with power and duties carefully delineated by the three governments concerned.

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[8] The abridged version neglects to mention the location of the eighth dam.

[9] The main purpose of monsoon irrigation is to transform the unpredictable pattern of monsoon rains into a time distribution of water more suitable to the needs of crop production. The dams and reservoirs would be of only limited use in the years when monsoons arrive late because of the danger that the reservoirs may themselves be empty at that time.

The scheme prepared by Mr. Voorduin was examined and approved by a Technical Mission consisting of two American engineers with whom were associated two Indian engineers. At a meeting held in April 1946 it was decided to appoint an Administrator pending the establishment of a properly constituted authority. The Administrator would proceed with preliminary designs of structures and advise the Central Government on all problems related to the project. B. K. Gokhale was accordingly appointed Administrator in May 1946, and he was succeeded in that post in October 1946 by S. N. Mozumdar who later became the DVC's first Chairman.

Involving the Participating Governments

The next problem was to decide who would build the project. The principal difficulty was that most of the benefits would accrue to West Bengal, but the dams would all have to be built in Bihar, and that State would suffer the consequences of having to relocate over 100,000 persons whose homes and lands lay in the areas designated as reservoirs. All of the flood control benefits, and nearly all of the irrigation benefits, would be enjoyed by West Bengal, although the power benefits would be shared equally by West Bengal and Bihar. The solution adopted was to establish an autonomous corporation responsible to the Central Government but financed by contributions from all three participating governments. The formula written into the DVC Act for sharing costs is the following: flood control was to be financed equally by the Government of Bengal and the Centre until the Centre's contributions reached Rs. 70 million (approximately $9,333,000 American at the present exchange rate), after which Bengal would pay all the costs. All three governments would share the power costs equally. Each provincial government would pay the capital cost of the works constructed exclusively for irrigation in its province, but the remaining capital cost, in particular, the share of the dams allotted to irrigation, would be divided among the provinces in proportion to their guaranteed annual off-takes of water for agricultural purposes. By this formula Bihar was to bear none of the costs of flood control; it was to pay for irrigation only in proportion to the irrigation benefits enjoyed in Bihar, and it was to pay only two-thirds of the cost of electrical power made available to Bihar by the DVC.

Since most of the proposed activities of the DVC were assigned by the Constitution of India to provincial jurisdiction (including water supplies, irrigation, canals, embankments and water storage, while electricity is a concurrent power) it was necessary for the provinces to

pass legislation permitting a Central Government corporation to exercise these powers.

Finally, before the Damodar Valley Corporation could be established it was necessary for the legislatures of all three governments to pass the DVC Bill.

The Corporation is Formed

The DVC Act passed by the Constituent Assembly of India on March 4, 1948 was the first development measure introduced after Independence. As an illustration of the Bill's favourable reception by the Assembly one speaker predicted that the DVC would turn "a valley of death and destruction into a valley of prosperity and happiness."[10]

The TVA approach is evident in the following statement by N. V. Gadgil, the Minister of Works, Mines and Power, who introduced the Bill:

> "Let us agree that when we entrust such a big sum running into Rs. 52 crores, practically handling the destinies of 50 lakhs (5 million) and their welfare, in fact it becomes a sort of administration by itself, charged with everything—their welfare, industrialization of the area, agriculture, even municipal administration, everything that a government is expected to do. . . ."[11]

Referring to the resettlement of persons from the 100,000 acres to be submerged by the reservoirs the Minister stated that "every person who will be uprooted from the soil will be settled, not in the same surroundings, but in better surroundings. He will exchange his hovel for a decent cottage, darkness for light, and fanaticism for faith".[12]

One member, however, regretted that "the technical papers, data, information and material on which this project has taken its final shape are not before the House."[13] There was no discussion of the economic feasibility of the project, the assembly simply accepted the Minister's assurance that the project would pay for itself many times over. In fact the Minister gave as estimated cost the extremely rough calculations made by Mr. Voorduin three years before and believed by some at that time to be half the real cost. Later there was to be much dissatisfaction

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[10] *Constituent Assembly of India (Legislative) Debates*, Vol. III, p. 1834.

[11] *Ibid.*

[12] *D.V.C. Bill Debates*, p. 1848.

[13] *Ibid.*

with the DVC when the actual cost of the very projects Mr. Voorduin recommended turned out to be several times as great as Mr. Voorduin's estimate.

The foregoing discussion makes it clear that the DVC was conceived to be a new administration with jurisdiction carved out of the jurisdiction of existing governments. Furthermore, although the Minister's statement was surely an exaggeration there was undoubtedly the suggestion that the DVC was to be almost a government in itself, established to formulate and implement a development plan for a region. A foretaste of future difficulties may be had when one raises the question of what would happen to the DVC after the establishment of national development planning, and after the States developed their own facilities for undertaking the activities entrusted to the DVC. These difficulties do not seem to have been predicted in 1948.

DVC Organization

The 1948 Act prescribed that the Corporation (*i.e.*, the Board of Directors) consists of a full-time Chairman and two full-time Members appointed by the Central Government after consultation with the two participating State Governments.[14] The Central Government also appoints the Secretary, who is the chief executive officer and the Financial Adviser, whose main function is to keep a close watch on costs on behalf of the Ministry of Finance. Before 1958 the Board of Directors seems to have undertaken the chief management functions themselves. Since 1958 the two Members have been part-time, the Secretary has been given more powers together with the additional title of General Manager and two of the Chairmen appointed since 1958 made their headquarters not in Calcutta but in New Delhi by order of the Government of India. The powerful Financial Adviser examines and comments on virtually every item placed before the Board of Directors and attends the Board's meetings, though he does not have a vote. He may refer any matter he wishes to the Corporation, and between 1951 and 1961 whenever there was a difference of opinion between the FA and the Board of Directors the FA was required to report that matter to the Central Government and ask for a decision.

The Corporation hires all other employees directly without intermediation by the Public Service Commission through which Central Government personnel are hired. The DVC's management personnel

[14] A copy of the DVC Act may be found in United Nations, E.C.A.F.E. *A Case Study of the Damodar Valley Corporation and its Projects*, Flood Control Series No. 16 (Bangkok, 1960), Appendix 1, pp. 92-102.

have in nearly all cases been taken from civil service posts within the participating governments according to the following pattern. The Chairman is appointed from the Central Government, one Member from West Bengal, the other from Bihar. The Secretary may be from West Bengal or Bihar but the chief officers under him are appointed alternately from each State. The DVC is organized and operated in the same manner as a Central Government department, and its employees are subject to the same salary scales and almost the same service conditions as are in effect in the Central Government.

In the beginning there was some confusion as to how much independence the DVC enjoyed, but since those first years the Corporation's statutory autonomy has progressively been more narrowly interpreted by the participating governments.[15]

Teething Troubles

It was decided to build the Damodar scheme in two phases. The first phase was to consist of:

(1) Four dams—Maithon, Panchet Hill, Konar and Tilaiya—the four being thought sufficient to provide flood protection against the largest flood on record, that of August 1913.

(2) An irrigation system that would be capable of supplying water to one million acres in the monsoon season and 300,000 acres in the dry season.

(3) Bokaro Thermal Power Station with a capacity of 150 MW plus hydro power stations at the four dams with a total capacity of just under 150 MW.

Enquiry Committee Report

The DVC experienced a series of troubles in the early years.[16] Originally it had wanted to contract out to private firms the jobs of designing and constructing the dams because, being new, it did not have suitable technical and construction organizations to do the work itself. But when the Corporation called for tenders for Tilaiya Dam it received only one offer, and rejected it because the rates were too high. Subsequently the Corporation built Tilaiya itself, but, because its engineers

[15] For a detailed discussion of this process see my doctoral dissertation *The Damodar Valley Corporation, op. cit.*

[16] The discussion of teething troubles is taken from *The Damodar Valley Corporation Enquiry Committee Report*, Ministry of Irrigation and Power, (New Delhi, 1954). The Chairman of this Committee was Mr. P. S. Rau who later became the DVC's Chairman.

ınd consultants could not agree among themselves, it changed the de- ;igns several times, making the last change well after construction was ınder way. The DVC gave the design contract for Konar Dam to a ⁼rench firm, even though its engineers had misgivings about the firm's ıbility at designing. The Corporation had found itself in a dilemma. The dam had to be finished in time to supply cooling water to Bokaro Thermal Power Station when it was ready, and this plant, being :ompletely designed and built by an American firm, was expected to be inished on schedule. The few Indian firms capable of drawing up lesigns for Konar would take too long and it was thought that foreign :xchange would not be available to hire a foreign firm of designers.)nly after construction was started in March 1950 were the French irm's designs found to be defective. The new designs necessitated a ıew contract with the Indian contractors who had been hired to under- ake construction of the dam. By the time the new designs were ready t would have been extremely costly to replace the contractors, so the ater had a bargaining advantage, and they used it to compel the DVC o agree to large increases in rates. The DVC was subjected to a bar- age of criticisms from the participating Governments for these conces- ions, and the matter was taken before an arbitrator. After examining he voluminous evidence presented during lengthy hearings, the ırbitrator concluded that most of the increased rates were fair and just, ›ut his decision was not reached until 1961, and in the meantime, ›artly because of the unhappy experience with Konar, the DVC decided ıot to contract out the construction of Maithon and Panchet Hill dams.

Some of the difficulties with Tilaiya and Konar might have been ıvoided if the DVC had hired a Chief Engineer before November 1950. t commenced its search back in 1947 and even sent its Chairman and its ›ecretary on different occasions to America to interview candidates, ›ut was not willing to pay the high salary demanded until it was clear hat there was no other choice. Part of the delay seems to have been lue to uncertainty as to whether the authority for hiring a Chief ːngineer belonged to the DVC or to its controlling ministry.

The DVC's teething troubles were brought to the attention of the ›ublic by a report of Parliament's Estimates Committee,[17] and later by he Damodar Valley Corporation Enquiry Committee. The criticisms evelled at the DVC by the latter resulted in the resignation of the DVC's irst Chairman and first Secretary. From that time on the DVC's ›ublic image started on a decline which has continued downward ever ınce.[18]

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[17] *Fifth Report of the Estimates Committee of the First Lok Sabha*, New Delhi, 1952.

[18] This judgement is based on interviews with persons acquainted with the DVC and ›n editorials in the *Statesman* of Calcutta and other newspapers.

Rehabilitation

The DVC debate made clear that the Government intended to transform the painful task of resettling 100,000 persons into an opportunity to give these people a new and much better life. It was probably necessary for the other participating governments to make a generous offer to displaced persons in order to win Bihar's consent to the Damodar Project. However, the lofty hopes of the planners were never realized. Their intention had been to compensate displaced cultivators as far as possible in kind by giving land for land and house for house instead of cash. But the attempt to rehabilitate in kind failed almost completely.[19] Of the 343 houses built, only 161 were accepted. The families who occupied the houses blocked up windows, made many other changes, and in a few cases tore the buildings down and rebuilt new structures out of the same materials. There were not many takers for land either. Up to 1964 hardly more than 5 per cent of all rehabilitated families had accepted land. Nearly everyone took cash compensation which apparently was soon dissipated. "Twice the Assembly of the West Bengal Government endeavoured to re-colonize these unfortunate people from the streets of Calcutta onto the farm lands, but without appreciable success."[20] The DVC has continued to the present its offer to rehabilitate in kind at nearly twice the cost of cash compensation.

No careful study has ever been made to explain why compensation in land was rejected, but the following reasons have been suggested by various observers. The E.C.A.F.E. study states that "construction schedules were not in harmony with the transmigration of the uninstructed masses living in the river bottom lands".[21] Rehabilitation officers told me that politicians had moved among the people and persuaded them to reject land and houses in the expectation of doing better for themselves. Because the DVC has had to reclaim land from waste areas this land was of lower potential than the land which the displaced persons had formerly owned. But in such cases the DVC gave cash compensation to make up the estimated difference. Many persons may not have wanted to move as far away as the new villages, even though these were located less than 50 miles from their former homes. Those persons who possessed land partly in the reservoir areas and partly outside had readily understandable reasons for not moving. There seems to have been a serious failure of communications

[19] Data on rehabilitation up to 1960 may be found in United Nations, E.C.A.F.E. *A Case Study of the Damodar Valley Corporation and its Projects, op. cit.*, pp. 64-68.

[20] *Ibid.*, pp. 64-68.

[21] *Ibid.*, p. 64.

between DVC and local residents. The Corporation held meetings with villagers and five high school graduates circulated among them for a year, but the Corporation failed to learn what the villagers wanted.

Subsidiary Activities

The DVC's Soil Conservation Department seems to have had a little more success with villagers. Before 1960 the Department had won the cooperation of farmers in 20 villages to consolidate their fragmented holdings and redistribute them in portions divided by lines running parallel to the contours of the fields. These activities, however, were abandoned after 1960 on the grounds that community development activities are more properly the responsibility of the Bihar Government.

Although the Soil Conservation Department seems to have undertaken a large variety of activities it had not got far with any of them by late in the Third Five Year Plan apparently for reasons of lack of staff and resources. For example, detailed soil surveys had been completed for only 817 square miles by early 1964 although the Department itself estimates that it is possible for a party of three men to survey ten square miles per month.

In the early years considerable emphasis was placed on developing subsidiary activities. Those started included: anti-malaria operations; development of commercial fishing in the reservoirs; promotion of tourism by providing boating in the reservoirs, parks and accommodations; free soil testing services for farmers; the training so far of several hundred soil conservation students from a number of States, and experiments on the utilizaion of irrigation facilities at Panogarh Farm. A finishing workshop for hand-forged items, a cold storage plant for potatoes and other foods, and a lock factory were set up. However, the Rau Committee, and later the Participating Governments' Conference of October 1954 argued that the DVC's subsidiary schemes should be confined to activities directly connected with the proper maintenance of the reservoirs and canals, *e.g.*, soil conservation, afforestation, welfare measures like anti-malaria operations, agricultural demonstrations and pisciculture, and recreation services at the reservoirs. All other activities were supposed to form part of the National Plans and be undertaken by the State Governments. Only at their request could the DVC undertake these activities and at their expense. A short time later the Government of India issued a formal directive to the DVC instructing the Corporation to transfer any subsidiary activity to a participating Government if it requested it. Not long after, the finishing workshop, the cold storage plant and the lock factory were

transferred to the State Governments in whose territory they resided. These steps were the first indication that the DVC's authority for regional development was coming into conflict with the emerging administrative structure in India. That structure was based on the elements of the national Five Year Plans, the first of which began in 1951, and the five year plans of individual States, with the implementation of those plans being left respectively to the Central and State Governments. In terms of this structure, the DVC was just a redundant administrative unit planning for and performing functions that normally belonged under State jurisdiction. In this conflict the DVC's regional authority gradually gave way. Within seven years of the DVC's establishment the process had begun of whittling the Corporation down from a regional development authority to an engineering organization.

Flood Control

By mid 1959 the dams in the First Phase were nearly completed. However, in October of the same year the Damodar River flooded causing very heavy damages. The flood which caused these damages was not as large as the target flood which the four dams were supposed to be able to control. The reasons why the flood system failed are:

(1) Water levels in the reservoirs were higher before the flood started than the DVC's own reservoir operations guides indicated they should have been for that time of year, because the Corporation had decided to store an extra amount in order to send a flushing dose down the river to clean it out.

(2) The reservoirs were not allowed to fill to their limits because the upper portions were still inhabited by villages and a pump-house of Sindri Fertilizer Corporation and because Panchet Hill Dam had not yet been completed.

(3) There was a breakdown of communications during the flood between the DVC's Manager of Reservoir Operations, reporting stations upstream and West Bengal Government engineers downstream who reported on water levels. The communications breakdown had the result that water was released from the dams at too slow a rate in the early part of the storm.

The rather surprising fact that there were still many farms and families remaining withing the reservoirs in 1959 is attributable partly to the trouble encountered in rehabilitating those families who did move. At the time of the flood, the DVC apparently had no plans for moving the remaining inhabitants. This meant that if the DVC were

to follow a policy of never flooding the property of residents in the reservoirs, 35 per cent of the existing flood storage capacity would have been wasted, and flood protection for the Lower Valley could be drastically reduced. During the 1959 flood water in Maithon and Panchet Hill Reservoirs did in fact rise far enough to flood some but not all of the houses and fields of the people living in the reservoirs, but from 1959 at least to 1964 the DVC's reservoir operations guides have forbidden their being flooded again.

After 1959 the DVC tried to persuade the participating governments to let the Corporation acquire the remaining property. However, after four years of procrastination by the two State Governments the request was turned down by Bihar, and when these words were written, the people were still living in the reservoirs.

About the time that the four dams were completed, the DVC appointed the Augmentation of Water Resources Committee with membership comprising engineers from the Government of India, the Government of West Bengal and the DVC to investigate the need for further measures to improve and augment the Corporation's water resource system, that is, to investigate whether the Corporation should proceed with Phase Two of Mr. Voorduin's plan. The Committee's main recommendation was the construction of a fifth dam which, if correctly used, would provide enough flood control to protect the valley against flooding from a 15 inch storm in five days and would store enough water to meet the foreseeable increase in demand for industrial and domestic water consumption. It was estimated that a 15 inch storm in five days would strike the valley only once in 165 years.

The DVC subsequently asked the participating governments for sanction to build the fifth dam. However, West Bengal opposed the scheme on the grounds that additional dams would so reduce the flow of water in the Lower Valley that there would be silting in the Hooghly River and other forms of deterioration would occur in other areas. After years of bargaining the fifth dam was finally sanctioned in 1964 to be constructed at Tenughat on the Damodar River, but since West Bengal refused to make any contributions towards its cost, the Government of Bihar is building the dam in Bihar alone to supply industrial and domestic water in the upper valley. The DVC is not participating in the project even though the dam is within the valley. West Bengal seems to have played a shrewd game in those years of bargaining, for it will presumably gain the benefit of some flood control when the dam is built, without making any contribution to the cost. But the consequence for the DVC of West Bengal's gain was that the

Corporation was once more left out of a project that had previously been included within its jurisdiction.

It is illuminating to contrast the planning for new dams in the Damodar Valley with the planning stages of water projects in the United States. For water resource projects in the United States prepared by the Army Corps of Engineers, group interests as of 1951 were allowed to present their views to the Corps and to Congress at a minimum of thirty-two stages.[22] Planning of water projects in the Damodar Valley has been largely an intra-governmental process in which various affected government interests have participated but only rarely have the views of non-governmental interests been sought. Yet it is desirable that the views of residents of an area affected by water projects be carefully taken into consideration. It would be desirable, for example, for residents of the Lower Valley to realize that their flood protection would be reduced by approximately one-third if the DVC persists in the decision not to flood the properties of those persons still living in the reservoirs. However, it would be making too great a demand to expect the planning of water projects in India at this time to manifest the sophisticated democratic involvement found in the United States.

Water for Industries and Irrigation

A development unforeseen when the DVC was formed was the tremendous increase in demand for water for industrial purposes. By the early 1960's the annual quantity of water supplied to industries exceeded that used for irrigation, and the demand is expected to continue to rise very rapidly, especially since little has been done to encourage conservation of water in industrial use by recycling, air-cooling and other devices. Water for industries has been made available by reducing the size of the target area for dry season irrigation.

The present irrigation targets are 970,000 acres during the monsoon period and 50,000 acres in the dry season, the latter being a big reduction from Mr. Voorduin's 760,000 acres. However, these reduced targets have not been achieved. As recently as 1964 only 654,000 acres received irrigation water during the monsoon season and only 36,000 in the dry season. The main reason for the shortfall up to 1965 is that although main canals had been constructed, branch water courses and field channels had not been built, so that water could not reach all the fields included within the targets. The DVC, acting on the DVC Act's provision that it be a bulk supplier of irrigation water, constructed

[22] Arthur Maass, *Muddy Waters : the Army Engineers and the Nation's Rivers*, Cambridge, 1951, p. 37.

irrigation channels to blocks with an average size of 600 acres, and left it for the villagers or the retail distributor, the West Bengal Government, to construct channels within these blocks. Until the field channels are constructed the only way that water can reach distant fields is for it first to flow over fields nearest the outlet. Often roads, gullies, hills and other obstacles do not permit water to reach more distant fields. Moreover, farmers with fields nearest the outlets generally retain the water until they get enough, and let it pass to other fields only after a lapse of some time, so that even those distant fields that do receive water do not get it when they need it. By 1965 the villagers had undertaken almost no construction of field channels, partially for the above reason but generally because of inexperience with irrigation techniques, and the West Bengal Government had built none but instead kept urging the DVC to build the field channels. In 1959, following a Planning Commission's recommendation, the Government of India requested the DVC to dig channels to blocks of 150 acres in size. However, the DVC's response was slow, and by 1964 little had been done. The DVC's hesitation to improve the irrigation system both before and after 1959 was partly attributable to its expectation that West Bengal would take over control of the whole irrigation system. In 1956 both the DVC and the West Bengal Government agreed that it would be more economical for West Bengal to control the bulk supply of water as well as the retail supply. Accordingly, in the same year, West Bengal promised to take over the system. However, it procrastinated and did not assume control until April 1964, and then it did so only on the condition that the Central Water and Power Commission take over management of the DVC's reservoir operations. Thus, two more important functions were taken from the DVC.

The DVC has at no time tried to form farmers cooperatives or devise related schemes to promote proper use of the irrigation water that it was supplying. Nor has the Corporation made any effort of a like nature with ultimate power consumers. In sum, with the possible exception of its soil conservation extension activities, mostly in Bihar, the DVC has not performed the role considered to be such an important component of the TVA model, that of helping final consumers to utilize the regional authority's products in the best manner, by forming cooperatives and so on. To some extent the DVC's behaviour may be justified by provisions of the Act which indicate that for both irrigation and power the corporation is to be bulk supplier and the two State Governments are to be retail distributors. The Act does not explicitly prohibit the DVC from making an arrangement with ultimate consumers, and it does state that the State Governments should consult with the corporation before setting rates for power and irrigation

water which are to be charged from ultimate consumers. In fact, the States have not consulted with the DVC about rates and there is little doubt that they would prohibit the Corporation from making any arrangements with ultimate power consumers. However, the Corporation might have tried to work more closely with irrigation users. Instead, the Corporation seems to have alienated many farmers by not adequately consulting with them before digging channels. Some farmers who were to have their fields split by irrigation channels obstructed workers trying to construct the channels by lying down on the ground where the new channels were to be dug.

Navigation

The DVC extended the Left Bank Main Canal to the Hooghly River, installed 22 locks and prepared the waterway for navigation at a cost of Rs. 47,500,000 (approximately US $ 6,333,000) over and above the cost of constructing the irrigation system. The canal was supposed to be finished by 1958; however, it was not ready for use until late 1963, and it had not been used except for testing as of April 1965. The reason for the delay is that a large additional capital expenditure is required for the purchase of vessels to ply the canal, and for a rope-way to conduct coal, the main expected cargo, from the mines to the water, but there has been doubt whether it is feasible to make this expenditure since it would possibly still be cheaper to transport coal to Calcutta by rail. The investment in the navigation may have been a complete waste of money.

In June of 1958 a Navigation Enquiry Committee had recommended placing the canal under West Bengal's management but as of 1965 takeover by the West Bengal Government of that portion of the canal which extended beyond the irrigation area was still under negotiation.

Electricity

The DVC supplies electrical power in amounts of 30,000 volts or more to the State Electricity Boards of Bihar and West Bengal for retail distribution and directly to industrial consumers who require power in such large voltages. It presently sells power to consumers within the valley and outside the valley as well. For example, it supplies much of Calcutta's power needs. Since 1962 the Corporation has exacted a price high enough to enable its power operations to yield a profit of 7 per cent on investment. This return is one of the conditions imposed in the DVC by the World Bank in return for granting loans for the construction of four of the DVC's thermal power units.

Between 1953 and December 1964 the DVC increased its aggregate power capacity from 154 MW to 604 MW; by mid 1965 the capacity was to be up to 729, and at that time two further 125 MW units were under construction.[23] The DVC's power system has at times been the largest in India, but for reasons to be explained its growth has fallen below that of other large systems.

At first the growth in demand caught the Indian Government off guard. Although the DVC had requested sanction to add another 50 MW unit to Bokaro back in 1953, the Government of India, dubious about its need, did not grant sanction until May 31, 1956. By mid 1957 the DVC's power facilities were under strain; in 1958 all consumers were requested not to increase their offtakes until further notice. In March and April 1961 there was a power crisis when three overworked generators of the Calcutta Electric Supply Corporation broke down at a time when the DVC's three newest thermal units were out of commission because of faulty design. The power shortage lasted until the first 125 MW unit at Chandrapura was commissioned in October 1964.

The Government of India raised no obstacles to the sanctioning of later additions to the DVC's capacity. But by the mid 1950's West Bengal and Bihar were making determined efforts to develop their own generating capacities with the result that, although they had agreed in 1947 to let the DVC produce power in their states, by the mid 1950's they reacted more as if the DVC were an unwelcome intruder. As a consequence, West Bengal opposed new generating units for the DVC causing delay in their being sanctioned, and managed to build its own thermal station less than five miles from a DVC thermal station within the Damodar Valley at Durgapur. It obtained the Centre's permission to expand this station against the will of the Planning Commission and the Ministry of Irrigation and Power, and only by the exertion of political influence. Subsequently, at the urging of the two State Governments the DVC was forced to agree not to increase its sales of power to consumers outside the Valley; later it was compelled to agree to withdraw existing supply as soon as the State Boards are in a position to serve these loads from their own power stations. In recent years the DVC has had to resist demands from the West Bengal Electricity Board to supply power from the Board's own stations to consumers within the Valley itself, hitherto a market reserved exclusively for the DVC.

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[23] All units subsequent to those planned in the First Phase have been thermal power units because they have been found to be cheaper sources of power in that region than hydro plants.

Reorganization of the DVC

In flood control, irrigation, power and many other areas, disputes with the State Governments, especially West Bengal, have arisen with increasing frequency, and the above case studies illustrate the manner in which these disputes have affected the DVC's operations largely by causing delays in the planning stages of projects. Although only a portion of the DVC's difficulties can be attributed to friction with West Bengal and Bihar it was largely as a result of this friction that the Government of India began in 1962 to examine schemes for reorganization of the Corporation. One scheme reported under consideration is the following: West Bengal would assume ownership and control of the navigation canal and other subsidiary activities in that State in addition to the irrigation system; Bihar would take over the DVC's Soil Conservation Department and other subsidiary activities in that State.[24] The Central Water and Power Commission would take over control of the dams and continue to operate the reservoirs. The DVC would then be reduced to a wholesaler of electricity, but the Central Government would want it to be wholly owned and operated by the Centre. If implemented, proposals such as these would bring about the total destruction of the "TVA Idea" in the DVC.

Alternatives to DVC

In the light of the DVC's experience it is useful to enquire whether an alternative form of organization would have been more suitable than the Corporation form. A substantial literature has been generated by the debate over alternative forms of administration of river valley projects.[25] In India the prevalent form is the control board system. According to this system actual construction is carried out departmentally by the governments in the States in which the projects are located, each government constructing that portion of the project which lies in its own State. The whole project is built under the supervision of a Chief Engineer who in turn often functions as Member-Secretary of a high level control board comprising Ministers and other very high

[24] *The Statesman*, Calcutta, December 7, 1963.

[25] For India the following sources examine the topic : *Fifth Report of the Estimates Committee of the Lok Sabha* (New Delhi, 1951-2); *Report of the Damodar Valley Corporation Enquiry Committee* (New Delhi, 1954), Chapter 8; Sudhir Sen, "The Future of Public Corporations" in Supplement of *Capital*, December 17, 1953; Henry C. Hart, *New India's Rivers*, (Calcutta, 1956), Chapter 9; Papers of the Fourth Irrigation and Power Seminar held at Hirakud, Orissa, January 14-16, 1957; E.C.A.F.E., Flood Control Series No. 19, *Proceedings of the Fourth Regional Conference on Water Resources Development in Asia and the Far East*; A.H. Hanson, *Public Enterprises and Economic Development* (London, 1959), Chapter 10.

level officials from the Centre and the State Governments concerned.[26] The control board meets once every six or eight weeks, and its main functions are, firstly to expedite the making of high level decisions requiring the approval of all participating governments, secondly, to devise arrangements so that the project authorities can cut through red tape for such matters as making purchases and hiring personnel, thirdly, to coordinate the various components of the project. Since the boards do not have statutory legitimation, they officially have no power, but conventions have been adopted by some boards whereby the decisions taken by them are automatically implemented by the participating governments. Arrangements have been made in some cases for emergency decisions to be taken between meetings subject to later ratification by the boards. Each board is assisted by a whole-time Chief Accounts Officer and in many cases by a Financial Adviser as well.

The research undertaken by the author was insufficient to permit a rigorous comparison of corporations and control boards; however, the foregoing discussion raises some issues which are of fundamental importance for such a comparison.

Under the control board system the various activities are operated by the participating State Governments. However, under the corporation approach, the corporation operates the activities. For the DVC it was shown above that this has led to problems of overlapping jurisdiction. These problems have been sufficiently serious that it appears now that it might have been better for the State Governments to have performed many of the DVC's functions right from the start. As far back as 1956 the DVC and the participating Governments all believed that it would be more efficient for West Bengal to control the DVC's irrigation system than for the DVC to do it. The discussion on page 101 indicated that with two organizations involved it was possible for each organization to shirk its own responsibility and simultaneously to blame the other authority for any shortcomings in the system. Matters such as the location of field channels and outlets, the timing and quantities of water supplied to particular fields require close coordination between the builders of the irrigation system, the operators, the State agencies responsible for agriculture and the users, and this coordination would be facilitated if the State Government were fully responsible for the irrigation system. The State Government would have more of an

[26] For detailed descriptions of this form of administration see: E.C.A.F.E. Flood Control Series No. 11, *Multiple Purpose River Basin, Development in India, Burma and Pakistan*, (Bangkok, 1956) and a paper presented at the Fourth Irrigation and Power Seminar held at Hirakud by the Ministry of Irrigation and Power entitled "Control Boards for Major Multi-Purpose Projects." (mimeo).

incentive to prevent stealing of water by farmers near main channels if it was responsible for the irrigation system. Before the transfer, the DVC was paid for the supply of water on the basis of acreage irrigated as measured by the Government of West Bengal. In that situation both the Government and the farmers had an incentive to understate the area receiving water. With West Bengal in charge, if collections do not suffice to meet operating costs that Government has an incentive to raise the rates, which was not the case when the DVC was in charge.

Similar arguments can be made that the Navigation Canal should be under the control of the West Bengal Government, and were in fact made by the DVC Navigation Enquiry Committee. Soil conservation, promotion of fishing, agricultural extension and promotion of industries can probably be handled at least as efficiently by the State Government as by the DVC. At present, work done by the DVC in its subsidiary activities runs the risk of unnecessary duplication with the much larger programmes involving the same activities run by the State Government.

Power might be more economically produced in West Bengal and Bihar by a single inter-state system with giant thermal power stations. The DVC's system might have become such a grand system, but it was not allowed to. Alternatively, if the DVC had never been granted the power to produce electricity, the power needs in Bihar and West Bengal would presumably be served completely by the power stations of their respective State Electricity Boards, and if these were carefully linked together and with outside grids the reduction in efficiency below that of the single system might not be great. The present arrangement of three power systems is probably the least efficient solution, partly because there would be less scope for establishing more economical giant thermal power stations and partly because of time-wasting disputes between the three agencies responsible for power in the region. Even if the DVC could be reduced to a completely centrally owned corporation whose only function would be the supply of electricity there would very probably still be disputes between the DVC and the two State Electricity Boards because the DVC's jurisdiction overlaps those of the two State Electricity Boards. This competition seems to be the reason why the reorganization discussed on page 104 has not been achieved. The Central Government wants the DVC to continue as a power organization; the State Governments are reported to want the DVC to be disbanded completely and its power producing facilities given to them.[27]

[27] *The Statesman*, Calcutta, December 10, 1963.

The above discussion did not consider the problems of the hydro-stations located at the dams. The construction and operation of these are closely related to the construction of the dams and operation of the reservoirs and so there are grounds for arguing that the authority which controls the dams should control these hydro-stations as well. If the DVC's power system had been restricted to hydro-stations the dispute with West Bengal over who should build new thermal plants would have been avoided.[28]

The only functions in the operating stage that seem to belong more logically to the DVC than to the State Governments are: (1) reservoir operations, and (2) operations of the hydro plants. Apparently the West Bengal Government did not like the idea of the DVC operating the reservoirs, and so reservoir management is now under the management of the C.W.P.C. In any event, these functions do not require a government corporation for their operations. Hence, is it worthwhile to establish a government corporation for the construction stage only? If not, then a government corporation may not have been a suitable form of administration for the DVC.

Need for Independent Authority

The corporation, however, solved one problem that would have caused great difficulty for the control board system, that is, that the dams had to be located in Bihar while almost all the benefits of the dams go to West Bengal. As mentioned above, under the control board system each state builds that portion of the set of projects located in its own state. But it seems unlikely either that Bihar would have consented to build the DVC dams for the West Bengal Government, or that the West Bengal Government would have to let Bihar build the dams. But both states did agree to an independent agency, the Damodar Valley Corporation.

Perhaps the control board administration could have been adopted with the proviso that design and construction of the dams be contracted out to private firms. The DVC experience suggests that there were not any Indian firms in existence before the mid 1950's capable of handling the biggest DVC dams, so the contracts would have had to be given to foreign firms. But this solution has a drawback also. Under the DVC the dams were built primarily by Indians, and in this way their construction of the dam served an important educational function. Moreover,

[28] Since the total installed capacity at DVC hydro power stations is only 104 MW compared with the total DVC capacity of over 1,000 MW by 1967, difficulties of coordinating the offtake of power from the two sources should not generate much concern even if they were under separate ownership.

the DVC experience also suggests that unless the planning and construction of the dams were placed completely in the responsibility of a single supervising contractor it would be necessary to have a permanent strong and controlling authority with a large team of senior engineers and supervisors to hire and supervise the contractors.

Thus, some sort of strong, independent authority seemed to be necessary to build the DVC projects, unless the Central Government offered to build them itself. A Government Corporation is such an agency, but if the participating Governments were right in choosing a Government Corporation they may have erred in giving that corporation too many functions. But if some functions were separated from the corporation two problems would have arisen: (1) the need for some supervisory body like a control board at a more senior level than the corporation to coordinate the various related projects; and (2) the corporation might not have been able to justify its existence after the dams were built. Whether, in these conditions, a corporation would be the best form of administration, or whether some other type of authority would be preferable, is a question that cannot be answered here.

There are yet two further considerations. In its early years the DVC may have derived important benefits from being a pioneer organization conducting what was viewed as a promising experiment in development. It may have attracted unusually high calibre personnel and, in spite of teething troubles and delays, it may have undertaken its projects earlier and more competently than the governments of West Bengal or Bihar would have if they had been given responsibility for some of the DVC's projects.

Secondly, if the DVC had been deprived right from the beginning of all major functions except for building and operating the dams and the hydro stations, this solution would not in itself have prevented the 'teething troubles', the problem of rehabilitation, the 1959 flood, the failure to acquire all the property in the reservoirs, or the delay in sanctioning the fourth unit at Bokaro. It is true that if the DVC had not been allowed to build thermal power stations, the competition with West Bengal and Bihar for the right to build new thermal plants would have been avoided. In addition, if West Bengal had possessed the irrigation system from the start the irrigation potential might have been achieved more rapidly but yet irrigation projects throughout India have fallen far short of their potential in the early years of operation.[29]

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[29] A.O. Hirschman suggests several reasons why it may not be possible to realize the full potential on irrigation projects until some time after the main channels are constructed even in the absence of jurisdictional difficulties. See his *Development Project Observed*, (The Brookings Institution, Washington, 1967), pp. 69-71.

One possibility which has not been considered hitherto is to have enlarged the DVC's power and autonomy in the beginning, to have given it, for example, a monopoly of generation of electricity in West Bengal and Bihar, full powers over irrigation within the Damodar Valley, and much more autonomy from the participating Governments. However, it is doubtful whether this alternative would ever have been politically feasible, and secondly, whether it would have prevented wasteful disputing between the DVC and the two State Governments.

CONCLUSION

In conclusion, it is quite possible that there may not have been any superior alternative to the original DVC and the loss of some of the Corporation's functions does not imply that the Corporation has failed or even that these functions should not have been given to the Corporation originally. But whether it was wise or not to establish the Corporation, it is sad to see this enterprise that once had great hopes and that has likely had an enormous and beneficial impact in Eastern India now viewed by many people as a failure, treated by others more powerful than itself as an unwelcome intruder in their jurisdictions, drained of independence by all three participating Governments, left helpless to defend itself, a passive observer of its own dismemberment.[30]

[30] That the Corporation has been able to survive at all in the face of encroachments by the participating Governments is, as Professor Hirschman suggests, probably due to its ability to assemble quite early an experienced electrical engineering organization, which with the aid of foreign contractors, established one of the largest power generating systems in India. (A.O. Hirschman, *Development Project Observed*, pp. 49-50). The magnitude of the expansion of the DVC's thermal generating capacity was probably not foreseen in the 1940's, and it occurred during the very period when the Corporation was being deprived of other functions, but it has been resisted all the way, and that resistance, as pointed out on pages 28 and 29 seems to be seriously impeding future growth.

SATISFACTION OF AN ADMINISTRATIVE CAREER

P. R. Dubhashi

EVERY profession has its own satisfaction and its own way of measuring it. The politician seeks *popularity* and measures it by votes he secures; or else seeks *political power* and measures it by the favours he can bestow or by the years for which he wields high positions of authority. The businessman seeks money and measures it by the volume of profit or the bank balance; or else he seeks *economic power* and measures it by the share of business he controls or the number of people on his payroll. The writer seeks *fame* and measures it by the number of editions into which his books run; or else he seeks *intellectual power* and measures it by his control over the minds of his readers. The professional man—a doctor, a lawyer or an engineer—seeks *success* and measures it by the number of cases he wins; the doctor by the number of patients saved, the lawyer by the number of clients who secure favourable decisions in courts, the engineer by the buildings built with strong and secure foundations. Or else, all of them may measure their satisfaction with the measuring rod of money.

What is the measure of satisfaction of the administrator? The answer to a question like this can be given only at the end of an administrative career. But a fledgling young recruit seeking to join an administrative career may have to answer such a question at the beginning of his career itself—if his choice has to be conscious and deliberate. At any rate this was the question which at least one UPSC Chairman, known for his aggressive technique of interviews, would put to many a young man appearing before him. What would be the answer? The answers would vary from "to earn a decent salary" "to render national service". The first answer could be commended as candid and honest or condemned as selfish and mercenary; and the second lauded as worthy of high idealism or dubbed as dishonest and hypocritical—depending on the person who passes the judgment.

Be that as it may, it is obvious that an answer to the question has much to do with the quality of the administrator and the administration. Satisfaction is undoubtedly a psychic phenomenon and hence necessarily subjective in character—varying from individual to individual. But this subjective factor is the foundation of an objective result since, in the ultimate analysis, motivation governs performance.

It may be that the question is neither posed nor answered. It may just be dismissed as irrelevant. But that itself would be one way of answering the question. And the answer might well be the worst. Absence of motivation may be far worse than any motivation—however unworthy it may be! Because it may lead to a class of administrators who look upon themselves as mere flotsam and jetsam over the current of affairs. And then administration would be in a perpetual state of ennui—always drifting and without any purpose or commitment. A truly detached administration—but detached with a vengeance! A bad motivation corrupts but absence of motivation corrupts absolutely!

It does not take many years in the administrative career for the administrator to realize that he can seek none of the satisfactions that leaders in other profession can achieve. He cannot, like the politician, seek popularity nor like the author seek fame because the first article in his code of conduct is neutrality and anonymity. Popularity requires mass exuberance. It may require espousal of partisan causes. But the administrator is inhibited. His tongue is tied. He cannot always speak his mind. In some cases it may even result in his having no mind to speak! In any case a certain amount of detachment and aloofness is the necessary concomitant of an administrative career. The code of conduct of the administrative service enjoins on him silence and puts fetters on his communication. His rights of expression (if not thought!), association and action are circumscribed. Obviously fame and popularity cannot go with neutrality and anonymity. Traditionally, however, in India at least, an administrative career though it meant neutrality and anonymity did not mean poverty. Perhaps (even) today it holds good no longer. But gone are the days when monetary compensation for an administrative career could confer affluence. Sustained inflationary trend which began during World War II and continued almost without any interruption in subsequent years till today, has eroded the real value of the rupee, and, as in the case of all fixed income-groups, this has substantially reduced the purchasing power of the administrator's monetary compensation. The administrator of the yester years boasting of a well appointed personal establishment consisting of a valet, a butler, a cook, a mali, a dhobi, a maid and an ayah, etc., is for his present day version only a figure of the fairy tale with whom he finds no resemblance. An administrator of today should consider himself fortunate if he could afford good education for children and lay by enough savings to repay borrowed capital from Government for the construction of a small house. While there has been an absolute decline in the standard of living, it has been rendered all the more galling because it has been accompanied by the material improvement in the standard of the living of members of the variable

income groups—particularly businessmen; professionals like doctors; contractors, etc., who, thanks to the rising tide of an expanding economy, have been able to build fortunes in the course of a decade!

No popularity, no fame, no wealth. What about power? In the first instance, let it be said that exercise of power *per se* over others is a source of satisfaction only to the coarse and the vulgar. But power in the sense of ability to influence men and events, capacity and opportunity to take responsibility, and exercise of leadership can be, and has indeed throughout history been, a source of satisfaction to men of worth. But power is not an independent entity. It stems from other sources. It is political, economic, intellectual or spiritual. Political power depends on political environment and organization, while economic power on wealth. In the pre-Independence set-up of bureaucratic state, power real and substantial—and sometimes perhaps even absolute—vested in the administrator. After the attainment of Independence, this has radically changed. Everybody and certainly the administrator knows that power in the ultimate analysis vests in the Ministers whom he can certainly advise but who must finally decide. Of course, in our system of administration, vast powers of day-to-day administration are delegated, through law and instructions issued under the law, to the administrator. And the vast expansion in the scope of administration, both because of the plans for economic development and measures for social welfare, has tended to create a new 'administrative state' but it would be an exaggeration to call it a 'new despotism' of the administrator.

In our status conscious society, satisfaction for many people is derived from 'status' though for the finer souls this may be hardly a worthy source of satisfaction. At one time, the ICS was considered to be a heaven-born civil service whose members were a breed apart. With the absolute and relative decline of material compensation and power, there has been a sharp decline, both relative and absolute, in the status of the administrator. Politicians holding positions of power, wealthy businessmen (no matter how money is earned!), actors and actresses have all stolen a march over the administrator in terms of social status symbolised by ranking at social functions, invitations to inaugurations or VIP treatment! Perhaps this is what is meant when people say that IAS has lost its glamour!

And perhaps worse than any of these factors is the lengthening shadow of criticism—sometimes as carping and constant as it is uninformed and unjustified. Everybody likes to join a chorus of criticism when something goes wrong, especially when critics do not have to share any blame or responsibility. Politicians even in authority have not

hesitated to denigrate the administrator in the public and throw all blame on them for the failures of planning, forgetting that the administrator is hardly in a position to join issue in a public controversy—and thus forsaking an elementary sense of fairness. Public administration is the one profession in which one can be an expert and write about it without having any experience in it! Such experts in public administration have not hesitated to pass strictures on the administrator, accusing him of "lacking sympathy and imagination, lacking development mindedness, lacking sense of democracy, lacking courage to take decisions, lacking action mindedness, etc.", and at the same time describing him as wooden, overbearing, domineering, die hard, hide-bound! Such strictures bring back to mind the famous stanza of Bhartrihari on the fate of the servant (which would apply to the civil servant also)

> "If he is quiet, he is dumb; if he is articulate he is contentious;
>
> If he tries to come in close contact, he is aggressive but if he keeps aloof he is immature;
>
> If he is tolerent he is timid but if not, he is impatient or ill-bred;
>
> Inscrutable is the role of the servant, beyond the comprehension of even a Yogi!"

Administration can, indeed, be a thankless task and a thankless career where one gets no credit for good work done but might be blamed for some else's folly! An overzealous administrator may feel like Cardinal Wolsey at the end of his career that "if I had served God with half the zeal with which I served the King, I would not have been let down in my last days!" Constant criticism of a general nature may create a permanent sense of guilt in the administrator. No one functioning in a chronically hostile atmosphere can have any sense of satisfaction. But without some sense of satisfaction no one can function.

But it is said that the administrator has to be thickskinned knowing that administration is a thankless task!

Prof. Cairncross, an economist who spent several years of his career as a civil servant, recollects a senior civil servant telling him that no one can begin to be civil servant till he becomes thoroughly frustrated and stands such frustration! A cynical member of the ICS, when told by his colleague that a certain action would be against his conscience, asked him whether after years in administration he has been left with any conscience! Administration is a tough job and an administrator cannot afford to be soft. But toughness and maturity can never mean a total eclipse of sensitivity or bartering away one's conscience.

Administration can never cease to be human and an administrator cannot turn himself into an automaton.

Thus, an administrative career has lost its lure because it is no longer the gateway to either wealth or power or status. It has been clouded by constant public criticism. Even in terms of ordinary material compensation it has lost much both absolutely and relatively to other professions and walks of life. True it does guarantee a period of over thirty years of stability with a fixed income, steadily rising with increments which to a person of modest habits and with a family of moderate size can provide, by Indian standards, a reasonable level of living. But surely to ambitious and talented young men, this is hardly a promising prospect. A career promising a life-long vegetative existence cannot attract talent. And this is exactly what has happened. The number of young men aspiring for an administrative career and appearing for competitive examinations for IAS and allied services has fallen not only relatively but also absolutely and there has been a particularly noticeable fall in the number of first class students who may be taken to be the cream of our youth.

"But after all, is this really so regrettable?"—one may ask. Administration need not be an attractive career for the flower of our youth—who should rather go to Science (in this age of science, though a scientific career itself may turn out to be administrative!), to Technology and Engineering (notwithstanding the unemployment among the engineers). Administration is a humdrum, pedestrian job and second rate young men are good enough for administration or an administrative career is good enough for them! In countries like U.S.A., it is argued, the administrative career is rightly considered to be not for the best.

It is essential for us as a nation to be clear of our position on this issue. It is not only a question of administration as a career for our young men; it is ultimately a question of the place of administration in national life. Indeed the two issues are closely connected. The connection is as that between education and economic development. It is a question of utilization of our manpower and talent for the attainment of our national objectives. For a poor country in a growingly prosperous world no national objective can have a higher priority than economic development because this is the only means of banishing poverty and unemployment and raising the standard of living of the average citizen. Economic development is a vast and complex process, involving several areas like education, construction, agriculture, industry, etc. The process has to be supported by scientists who

produce or adopt new ideas and techniques, and technologists who apply the techniques, and engineers who build and construct. But an equally important task is that of social engineering, that of organization and mobilization of resources—both human and material, and this is the task of administrator. The gap between ideas and results has to be filled by action and for the society as a whole this requires a collective action which is what public administration is. During nearly two decades of planned economic development we have repeatedly realized that ideologies take no bread—nor do ideas. They have to be *applied* through programmes of action. Translation of ideas into action through organization of practical programme requires knowledge, skill, perseverance, techniques and above all, imagination which, in a country and community such as ours beset by all kinds of psychological, cultural, social and economic inhibitions, only first-rate men of intelligence, stamina and character can possess. With every progress of science and technology, administrative career should be *more* and not less important because with every such progress, the organization or initiation of social action through administration of schemes of programmes becomes more important.

But would such general importance of public administration in national affairs attract a young man of talent and ambition to an administrative career notwithstanding its declining attraction in terms of material compensation, social status and recognition and public esteem? Every young man, if he is worth anything, wants to set the Thames on fire. Can he do so in an administrative career ? Life's noblest satisfaction is in the ultimate analysis derived from the total dedication of one's self to a worthy cause. This is, no doubt, high idealism but after all that is the fountain spring of satisfaction—not a low aim or mere vegetative mundane existence. A life whose whole history can be written in advance, when the young recruit joins, just in one sentence, *viz.* "Mr. X joined IAS in year n^0 and retired in the year n^{30}" is just not worth living—certainly not for a worthy man. Struggling for our nation's economic development and social change is as worthy a cause as the attainment of Independence, though some people are apt to forget this. But not every administrative position gives the feeling of being near the worthy cause! Moreover, even if one were placed in such a position, one knows that it is only for a short tenure because the whirl or merry (misery)-go-round of transfers goes on continuously. The administrator is always a bird of passage. Administrator's life is always a transit-camp or waiting-room life. An administrator is a gypsy. A dedicated or a committed administrator may do many notable things and leave many good deeds behind and people may even remember him for long. The memory of many a good

collector pervades like a sweet fragrance years after they have left their districts. But what is the sum-total of all these contributions in a life career of over thirty years? There is no single monumental institution such as an educationist can build up, nor a might industry which an entrepreneur can set up—one which will always speak of their achievement. An administrator can indeed have no roots and will not be there to gather the fruit of his toil. He is like the child building castles on the sea-shore, only to see them washed away by the tide of time! That is the tragedy of the administrative career.

But there are compensations. And these arise out of the limitation themselves. *First*, the administrator bound as he is by service rules, with his liberty of expression and association strictly circumscribed is still in a sense free. He is not beholden to any single individual. He need have no personal allegiance. The allegiance is only to government, to the Constitution and to the country. Neither in business nor in politics nor in many other spheres of public activity is this freedom always available. The administrator is obliged to serve no partisan interest, no pressure group, no private interest. He need depend on the will or pleasure, whim or fancy of no individual for his livelihood. No bondage can be worse than to an individual and the administrative career saves an individual from it. He may suffer, if he is unfortunate, from arrogant bossism but never from a life-long bondage. *Second*, and closely connected with this blessing of personal freedom, is the constant preoccupation with public interest, a constant engagement in national service. The young man, who told the public service commission, that he wishes to join the Indian Administrative Service because he wants to render national service was neither being a hypocrite nor an idealist; he was speaking the plain truth. There is nothing more ennobling or satisfying than the realization that transcending all "narrow domestic walls" of localism, sectionalism, communalism, casteism, one can concentrate on the general interest of the people as a whole—and in particular of the weaker sections, the tribal people whose huts are burnt by fire, the widow who lost her breadwinner in a mine accident. the landless cultivator, the poor artisan. The single-minded pursuit of national interest (which is what an administrative career is) may be interrupted by interferences by the interested parties and the administrator may find himself frustrated as a consequence. But the interferences are no part of his making and at least his conscience is clear. Clear conscience is life's greatest satisfaction! *Thirdly*, and again closely connected with the first and second points, is the essentially constructive and positive charactcr of the administrative career. The path of an administrative career may be strewn with conflict and criticism. But these latter are mere aberrations. The administrator

if he so chooses can steer clear of them. There are no opposition parties whom he has to attack, no rival business interest with whom he has to compete, no contending ideologies which he has to battle with. *Fourthly,* an administrative career provides a unique combination of action and reflection, realism and idealism, in one's life. One can be tired of preaching from a high pedestal principles which one cannot practise. Theories and philosophies which only remain in books can give no satisfaction—nor even to their exponents! A life of high thinking but actionless living cannot be satisfying. A satisfying career has to be a healthy combination of thought and action. An administrative career can combine soaring idealism with earthly realism. An administrator, throughout his life career is concerned with what Georges Pompidou has called "the burning reality". At the same he can, like Robert Kennedy ask not just "why?" and explain but "why not?" and do it. He can contribute to the formulation of plans, policies, programmes and projects no less than their implementation. Planting his feet firmly on the ground he can gaze at the stars, and if life's opportunity comes to him, he can be fortunate not only to have a vision but also give it a practical shape. If that happens, the administrative career can also give a life worth living.

Fifthly, the administrative career offers variety. Administration can be as varied as reality itself. Administration like reality is kaleidoscopic in nature. As a colleague in the IAS once put it—"Thank God, I do not have to sell soap or tea all my life!" A variety of problems, challenges, places, positions, situations, circumstances, institutions and individuals fill the administrator's career making it both interesting and complete.

COMMENTS

(In this feature we give comments received from the readers on the articles published in the previous two issues of the Journal. The comments should be critical and thought-provoking, and should be confined to the major points made by the author, inadequacies in his reasoning or data, or any new solution to the problem which suggests itself to the reader. They should not normally exceed 1,500 words.—Ed.)

EVOLUTION OF JUDICIAL FUNCTIONS OF THE COLLECTORS IN BENGAL PRESIDENCY, 1793-1833*

The article "Evolution of Judical Functions of the Collectors in Bengal Presidency, 1793-1833" written by Shri Chittaranjan Sinha is highly scholarly, revealing and informative. It affords an interesting and sustained reading particularly because the separation of the judiciary from the executive in the public services in our country has not been completed even by now.

The story of this evolution is a sad story of sacrifice of the "sacred principles of separation of powers and of the supremacy of judiciary in the domain of law" at the altar of expediency.

Lord Cornwallis had a firm faith in the principle of separation of powers which was fully in keeping with the modern concept of Rule of Law. This was duly reflected and summarised in the Preamble to Regulation II of 1793 which read: "The revenue officers must be deprived of all judicial powers..."

Thus to the pioneering zeal of Lord Cornwallis goes the credit of revolting against "the indigenous tradition of keeping the functions of revenue and civil justice united in the same hands".

One, however, does observe while going through Shri Chittaranjan Sinha's article that the structure and spirit of Cornwallis' hallowed system was subjected to an impious infringement on frivolous and flimsy grounds like the ones that follow:

"... a tremendous pressure of business" on the District Judges "which they found impossible to cope with." (p. 878)

"... a concession to the practical necessity of providing assistance to the Judges for a speedier disposal of such suits." (p. 879)

"... adding to the files of already over burdened Civil Courts of the districts." (p. 882)

"... the exigencies of revenue administration." (p. 885)

*The original article of this title by Shri Chittaranjan Sinha was published in the Journal in Vol. XIV, No. 4 (Oct.-Dec.), 1968.

"... temporary expedients for relieving over pressed District Judges." (p. 891)

"... (C.T. Metcalfe) had ruled in Delhi territory exercising himself all the powers of government—executive, fiscal and judicial. From that experience he had become an ardent champion of Munro's paternalism which stood for a despotic form of government." (p. 893)

"... and there was no alternative consistent with the dictates of financial necessity than to transfer those (Magisterial) powers to the Collectors." (p. 894)

"... the alarming state of arrears before the Civil Courts and delays in the disposal of suits had also convinced them of the necessity of reform in the Cornwallis' system." (p. 895)

"... due to the practical difficulty of providing enough covenanted Civil Servants to fill the posts of Magistrates." (p. 897)

Then, "for various considerations Canning finally decided to reunite the Magistracies with the Collectorships in all the Districts after 1859." (p. 897)

All these arguments boil down to this that although in principle separation of judiciary from the executive was an article of faith, in practice it could be and was actually postponed—nay even condoned—on one pretext or the other. One just wonders why the powers that he could not increase the number of judges to cope with the increasing work load that fell to their lot with the separation. But this was not to be.

This peculiar phenomenon indicates at the wide gap between profession and practice, ideal and reality, saying and doing, precept and example that we had been witnessing in our national life. It is, however, unfortunate that even after our attaining Independence and giving ourselves a Constitution things in this behalf have not registered any perceptible improvement.

It is a 'directive principle of State Policy' as enshrined in Article 50 of our Constitution that the State shall take steps to separate the judiciary from the executive in the public services of the State. In this way the principle of separation advocated by Lord Cornwallis as early as in 1793 was incorporated in our Constitution in 1949 and there were sound reasons therefor.

Reasons: Judiciary endeavours to preserve democracy by upholding the Rule of Law. It is the duty of the Courts to see whether the Executive acts in excess of the law. Justice should not only be done but should manifestly and undoubtedly be seen to be done. And all this would not be possible if a judge or magistrate trying a case is placed under the Executive and acts under its directions. It follows, therefore, that separation of judiciary from the executive is a MUST.

The 'directive principle of State Policy' relating to separation, it is unfortunate, has only been implemented partly despite the fact that two decades have elapsed since the Constitution of India came into force. In the name of

separation only cases under the Indian Penal Code (and not even under the preventive sections of the Code of Criminal Procedure as also under the Minor Criminal Laws) have been transferred from the executive magistrates to the judicial magistrates. This obviously is an eyewash. The history of the period 1793-1833 seems to be in the process of repeating itself.

We must learn a lesson from history and see to it that the sanctity of separation is not defied by dilatory tactics and temporary expedients. We have accordingly to ascertain what remains to be done to carry the separation of judiciary from the executive to its logical conclusion. Here are a few points for consideration to that end:

(1) Separation should cover all cases under any law of the land—Civil, Criminal, Revenue, Transport, Land, Labour, Industrial, Taxation, etc. On this point the conclusions arrived at by the African Conference on the Rule of Law organised by the International Commission of Jurists at Lagos, Nigeria January 3-7, 1961, have an appropriate applicability. They are:

> "It is recommended that all customary, traditional or local law should be administered by the ordinary courts of the land . . . " "The practice whereby in certain territories judicial powers . . ." are exercised by persons who have no adequate legal training or experience, or who as administrative officers are subject to the control of the Executive is one which falls short of the Rule of Law."

(2) The designation Executive Magistrate is a contradiction in terms. Such an anachronistic institution should be made to disappear.

(3) As judicial service officers shall be called upon to administer all customary, traditional or local law an exhaustive post-entry in-service training in various fields covered by the departments of Police, Prisons, Probation, Revenue, Transport, Industries, Labour, Taxation, etc., needs be imparted them. Refresher Courses should also be introduced. Our judicial services need to be as much enlightened and modern in outlook as independent and impartial.

(4) Successful working of the separation would depend on what type of recruits we get for the judicial services. With the clumsy and cumbersome course of LL.B. extending over three years after graduation the prospect is not at all bright. The course of LL.B. needs be put on par with B.A., B.Sc., B.Com. etc. It should be a four-year course after Marticulation or Secondary and should lay due stress on basic disciplines like Philosophy, Sociology and Political Science. After doing LL.B. those who want to join the Bar could go in for a two year professional course Bar-at-Law. Others might go in for academic courses—LL.M. and LL.D. In the ultimate analysis it will give a much needed fillip to institutional research in law as well.

(5) Due importance should be attached to the experience of the Bar in the judicial services of the country by recruiting only lawyers to the judicial services and by inducting the posts of Public Prosecutors and Government Advocates into the cadre of judicial services. Such a diversification of legal experience will foster dynamic understanding of legal problems in judicial service officers.

(6) The pay scales of the judicial services should be really attractive, the lowest paid man to draw a basic salary of Rs. 500 P.M. and the highest paid man a basic salary of Rs. 3000 P.M.

(7) Sixty per cent of the posts of judges of High Courts should be filled from State Judicial Services which after complete separation, it may be stressed, shall man the posts on the Revenue Boards, Industrial and Transport Tribunals, Labour Courts as also of the Government Advocates.

(8) The status of the District Judge should be higher than that of the District Collector. Residential accommodation befitting their status should be earmarked for all judicial service officers.

(9) Judicial powers should be decentralized starting with the Supreme Court above and ending with the Munsif Magistrate below. With consequent increase in the number of Munsif Magistrates their headquarters could be kept at the Tehsil headquarters if not at the Police Station headquarters. Justice would thus come nearer the villager and number of cases pending in various courts would also go down.

(10) Police should be absolved of semi-judicial functions like service of summons on witnesses to attend courts, carrying of evidentiary exhibits from court to court and finally escorting of undertrial or convict prisoners. Similarly the function of prosecution (*inter alia* including investigation also) which is a part of and as sacred as the judicial function should not only be taken away from the Police but be made independent of the Executive.

(11) Article 50 of the Constitution of India should be so amended as to set the twenty-sixth day of November, 1970 (when the Constitution of India will become twenty-one years old) as the last date by which complete tangible separation of judiciary from the executive in public services should be brought about in the whole of the Indian Union. Article 236 should be suitably amended and article 237 repealed.

Before concluding it may be reiterated that if separation of the judiciary from the executive is to be complete in all respects and successful as well, which is as it should be, the State Judicial Services shall have to be so imaginatively reorganized and Legal Education so dynamically reoriented as to measure up to the tasks ahead, which are and have got to be faced. And this is the most pertinent lesson we have to learn from the "Evolution of Judicial Functions of the Collectors in Bengal Presidency, 1793-1833." Let us not allow History to repeat itself. Colonialism with all that it stood for has vanished. Our's is a democratic society governed by the Rule of Law. And Rule of Law must prevail.

—G. C. SINGHVI

THE FULTON REPORT — SOME COMMENTS*

Shri Dey's is perhaps the only comprehensive commentary on Fulton in India. He presents a scholarly and thought-provoking analysis of Fulton's peak proposals and brings out, in the open, and in a reasoned way, some of the inadequacies of the Fultonian prescriptions.

*The original article of this title by Shri B. K. Dey was published in this Journal in Vol. XIV, No. 4 (Oct.-Dec.), 1968.

However, Shri Dey's doubts and skepticism about implementability of some of Fulton's suggestions stem from an overcautious bureaucratic attitude which itself can be thought to be the bane of the administration and which is what Fulton seeks to end or, in any case, mend. Given a technologically advanced society, where tasks are more developmental than regulatory, more sophisticated than simple or traditional, where open and free intercourse with not merely the private sector but also the community at large is inescapable, where the decision-making process itself has been, and has increasingly to be, punctuated by profound knowledge of numeric and economic analysis, and 'computerology', how can one forget the inevitability of 'professionalism'? We find the same echo in our country too. The IIPA-organized seminar on Personnel Administration (March 1968) and the latest report of the Administrative Reforms Commission on Personnel Administration bear ample testimony to it. That Fulton's stirring call for professionalism in civil service is not merely an empty slogan is evident from a concrete and well planned programme for achieving it—first by giving shape to the concept, then, suggesting steps for its realization—through training (civil service college), career planning, posting in one or allied areas for longer spells, creation of a new organizational set-up (*i.e.*, civil service department) for handling of all personnel questions, etc. Shri Dey's operational difficulties are not difficult to solve, once we shed the psychology of resistance to change and the age-old homily in honour of traditional generalism. Shri Dey's main difficulty is in regard to the placement of specialists in senior positions in fields totally different from those in which they may have worked earlier. But he has not correctly interpreted Fulton's recommendation: "At these (senior policy and management) levels individual's particular occupational group is thus of less significance than his range of experience, and personal qualities and qualifications should be the main criteria for filling posts with these wider horizons."* The above does not mean that the occupational experience is of *no* significance or relevance at all, as the author seems to interpret—it is only of *less significance.*

Shri Dey observes: "Fulton seems to synonymise professionalism in administration with technical aide to management like computor technology, operations research, costing, statistics, O & M, etc." Here too, Shri Dey shows lack of a fuller understanding of the Fulton report and its underlying spirit. Fulton defines the concept of professionalism in the civil service as follows:

> "We use the word 'professional' in this context to include two main attributes . . .
>
> "One is being skilled in one's job—skill which comes from training and sustained experience. *The other is having the fundamental knowledge of and deep familiarity with a subject that enable a man to move with ease among its concepts.*†
>
> "The work of government demands these qualities not only in the members of the generally recognized professions, but at all levels and in all parts of the Service. We use 'professional' in this comprehensive sense."

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*Report, para 222.

†*Italics* by the commenter.

In India, the Deshmukh Study Team's Report on Machinery of Government, etc., and, now the ARC's report on Personnel Administration talk not merely of the need for specialization but also suggest some practical ways for meeting this need. The 'functional service' concept of the ARC, its extension over a wide area of administrative activity and the open door to functional services to enter middle and senior management positions represent an attempt to induct professional expertise and specialized experience in the policy-making process. The ARC report recommends in clear terms that "The personnel so selected for senior management should be deployed in posts/areas with due regard to their previous specialised experience. It should, however, be possible for a senior manager to move freely from one broad area of middle management specialization to another allied area".*

Shri Dey does not take with the seriousness it deserves the proposed unified grading structure which signals the end of pockets of class or service whose scales of pay are determined without any reference to the responsibilities and duties of the post included in that class or cadre — which, as a consequence, results in the perpetuation of the privileges for some, while denying the same to others with equal responsibilities. It is difficult not to accept Fulton report's enunciation of the basic guiding principles, namely, 'look at the job first' with a view to determining "what new skills and kinds of men are needed and how these men can be found, trained and deployed" and what should be their pay scales evolved through job evaluation. In the modern age of scientific and democratic progress, it is difficult to concede that the job contents and pay should not follow scientific management and should be allowed to continue on a haphazard basis.

—S. P. VERMA

REPLY BY AUTHOR

Dr. Verma has sought to make a philosophical virtue of whatever Fulton has pronounced, on issues controversial in themselves and where no last word could be claimed to have been said by any one, howsoever eminent he be. In fact, in a field like personnel administration or civil service, no finality by way of dishing out one unique solution is possible— what is offered in fact, the near best solution is based on one's style of study, analysis, interpretation and judgment.

When the romantic spell of the first reading of Fulton ends, one discovers that the realities of administrative life may be and, in point of fact, are different from what the Committee thought them to be. The dominant tone of my article was all along to hail, and not to assail, the Fulton recommendations which could be considered for adoption, with the needed modifications, in our own country. I tried to examine Fulton's recommendations critically from the cold operational angle, uncontaminated by the needless feeling of 'hero worshipping'. However, Dr. Verma's observations do not help at all to resolve the difficulties in implementation pointed out by me. The principle of professionalism needs to be tempered with operational realities of administrative situations. As it has been mentioned in the article that "what is

*ARC, *Report (on) Personnel Administration*, April 1969, para 33.

needed, in the context of changed functions of modern government is a happy marriage between generalism and specialism retaining the best of both these words while avoiding the abuses of extremism in either". Highly professional men and sophisticated technocrats, placed at the highest functional level where they are required to tender advice to the political executive must, doubtless, have creative qualities of judgment, imagination, sense of perspective, comprehension of the wider implications of a particular decision, foresight and farsight which are supposed to be the adornments of a competent generalist.

The recent ARC's report on Personnel Administration also recognizes that "At the level of Joint Secretary and Additional Secretary in senior management outside the purely functional posts, the areas of specialisms will broaden out and it should be possible, and it is necessary to provide for mobility from one specialism to an allied specialism. At the highest level of Special Secretary or Secretary and equivalent in the Central Government, the factor that should count most is one's general managerial competence."* Even in a functional area as one climbs up the ladder of hierarchy towards the point of policy formation, one starts to shed narrow specialized knowledge and start delving in matters which are inter-departmental or even universal in nature, not confined to one's own speciality. The Fulton Report, too, makes a pointed reference to this. But this is in no way an advocacy of a system in which 'specialists' are contained in the narrow backchamber of the 'green room' or at the most the 'wings corner', leaving the stage mostly to the generalists in the drama of 'policy advice' and 'programmatic decision-planning' roles, every member of the public service must be given a part, based on the individual histrionic competence. Not merely that, everybody wherever he is, must be enabled to acquire such competence through equal opportunities, and then only we can have real democracy in bureaucracy.

—B. K. DEY

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*Report on Personnel Administration, *op. cit.*, para 35.

INSTITUTE NEWS

Shri Y. B. Chavan, the Union Home Minister inaugurated a two-day Conference on Training on February 24 which was sponsored by the Training Division of the Ministry of Home Afiairs.

About 90 participants attended the Conference. These included Training Coordinators of various Ministries and Departments of the Government of India and State Governments, representatives of training institutions and other experts in the field of training. The Conference set up 3 Working Groups—one each on "Identification of Training Needs", "Fulfilment of Training Needs", and "Evaluation of Training Programmes and Training of Trainers". A special meeting of the heads of the training institutions was also held to discuss common problems.

The Concluding Session of the Conference was addressed by *Shri L. P. Singh,* Secretary to the Government of India, Ministry of Home Affairs.

The proceedings of the Conference to be published by the Institute are under print.

The Institute organized during Jan.-March, 1969 the following courses for middle/senior level officials of the Central, State and Municipal Governments.

1. Third Course in Social Welfare Administration (Jan. 13 to Jan. 28)
2. Fifth Course in Municipal Administration (Jan. 27 to March 1)
3. Second General Course in Development Administration (Feb. 28 to March 15)

A two-day Seminar was held on Building Bye-laws from March 11-12. The participants included elected councillors form various States and Union territories as well as experts from specialized organizations.

An important study on "The Civil Service and Development Administration" has recently been completed for the Institute by *Dr. V. A. Pai* Panandikar, assisted by Shri S. S. Kshirsagar. The study tries to ascertain the attitudes and propensities of civil servants, both technical and non-technical, towards different administrative activities, to identify factors having a bearing thereupon and to evaluate the attitudes in the light of the requirements of development administration.

Lord Fulton (Chairman of British Committee on Home Civil Service) gave a talk on February 3 on "Some Aspects of the Problems of Administrative Reforms". The following lectures were delivered under the auspices of the Regional/Local Branches during the quarter:

Date (Branch)	*Subject*	*Speaker*
Pondicherry (Dec. 27, 1968)	"International Civil Service"	Dr. M. S. Adeshesaiah, Dy. Director General, UNESCO (Shri J. C. Mathur, ICS, Additional Secretary, Ministry of Food, Agriculture, Community Development & Co-operation, presided)

Date (Branch)	*Subject*	*Speaker*
Poona (Jan. 15)	"Urban Development Administration"	Shri B. A. Kulkarni, Commissioner, Poona Municipal Corporation (Shri S. L. Kirloskar, presided)
Ajmer (Feb. 8)	"The Rising Spiral of Crime"	Shri Anand Narain Mulla, M.P. (Shri Sardar Singh, Distt. & Sessions Judge, Ajmer, presided)
Nagpur (Feb. 11)	"Ideology in Administration: A Case Sutdy of Employees' State Insurance Corporation"	Shri V. S. Murti, Reader in Public Administration, Nagpur University. (Dr. N. R. Deshpande, Professor & Head of the Deptt. of Political Science & Pub. Admn., Nagpur Univ., presided)
Poona (Feb. 13)	"Civil Service Reforms in Britain: The Report of the Fulton Committee"	Shri P. R. Dubhashi, IAS, Hon. Secretary of the Branch
Pondicherry (Feb.)	"An Efficient Officer is not Popular"	Group Discussion by Members of the Branch and Special Invitees (Shri G. Sundaram, Secretary to the Govt. of Pondicherry, presided)

The recent publications brought out by the Institute are: (*i*) "Social Change in a North Indian Village" by Dr. A. P. Barnabas (Rs. 10.00), and (*ii*) "Administration of Government Industries" by Dr. R. S. Arora (Rs. 18.00).

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Dr. A. P. Barnabas, Reader in Sociology and Social Administration, proceeded on December 29, 1968 on temporary leave of absence from the Institute till December, 1970 to take up an assignment with the F.A.O. as Rural Institutions Officer in Afghanistan.

RECENT DEVELOPMENTS IN PUBLIC ADMINISTRATION

An important development at the Centre during the quarter under review was the regrouping of certain subjects among the Ministries and the Departments w.e.f. February 14, 1969. The main changes brought about are indicated below :

Prior to the Re-organization	*After Re-organization*
1. Ministry of Education	Ministry of Education & Youth Services. (It may be recalled that the Study Team on "The Machinery of the Government of India and its Procedures of Work" set up by the ARC had, in its interim report submitted to the Government in March, 1967, suggested the creation of a separate Deptt. of Youth Services in the Ministry of Education.)
2. Ministry of Industrial Development & Company Affairs	Ministry of Industrial Development, Internal Trade & Company Affairs. ("Internal Trade" has been taken from the former Ministry of Commerce.)
3. Ministry of Commerce	Ministry of Foreign Trade & Supply ("Supply" has been taken from the former Ministry of Works, Housing & Supply.)
4. Ministry of Health, Family Planning & Urban Development	Ministry of Health, Family Planning, Works, Housing and Urban Development. ("Works & Housing" have been taken from the former Ministry of Works, Housing & Supply. That Ministry, with the transfer also of "Supply" to the Ministry of Foreign Trade and Supply stands dissolved.)
5. Ministry of Petroleum & Chemicals 6. Ministry of Steel, Mines & Metals	Ministry of Petroleum & Chemicals and Mines & Metals. Ministry of Steel & Heavy Engineering. ("Steel" and "Heavy Engineering" formerly with the Ministry of Industrial Development & Company Affairs have been combined to form a new Ministry of Steel & Heavy Engineering.)
7. Ministry of Information & Broadcasting	Ministry of Information & Broadcasting and Communications. (Department of Communications has been added to the new Ministry.)
8. Ministry of Parliamentary Affairs	Ministry of Parliamentary Affairs, Shipping and Transport. (Former Ministry of Transport & Shipping which now stands dissolved has been tagged to this new Ministry.)

The National Academy of Administration conducted a special foundational course for two months in November-December 1968 for 41 probationers of the Indian Economic Service and Indian Statistical Service appointed on the results of open competitive examinations. After the completion of this training, these probationers are now receiving special training at the Institute of Economic Growth, New Delhi. The Academy has drawn up a programme of refresher courses for IAS officers of 6 to 8 years of service. Six additional posts of language teachers have been created at the Academy to improve teaching of regional languages. The language teaching personnel at the National Police Academy is also being strengthened. A significant development concerning institutional training of the IAS probationers is the decision of the Government to introduce sandwitch pattern of training with effect from July 1969. The foundation stone of the new building of the National Academy at Hauz Khas, New Delhi, was laid on February 13 by Shri Y. B. Chavan, Union Home Minister. The Central Secretariat Training School organized a seminar on Work Measurement in Administration in January 1969. It has also made a start in organizing training programmes in performance budgeting for senior officers.

Following an agreement arrived in the National Council of the joint consultative machinery, the Government of India issued orders in January 1969 for a full merger of dearness allowance with pay, effective from 1st December, 1968, at the 12 monthly average level. 175 of the all-India Average Working Class Consumer Price Index (General) (1949—100). The dearness allowance so merged will be treated as dearness pay and accounted as emoluments for pension, gratuity, contributory provident fund, and determinig the limits of pay for allowance and fringe benefits. The Government of Madhya Pradesh has also merged, with effect from December 1, 1968, a portion of dearness allowance admissible to Government servants, varying from Rs. 47 to 110 in the various pay scales of government employees ranging between Rs. 110 to 999.

In its recent report on National Archives, the Estimates Committee of the Lok Sabha has urged immediate establishment of an Indian Archival Council which was suggested 8 years ago by a group of experts. The Committee finds that little progress has been made in the programme of record management, record survey and appraisal. It has proposed publicity campaigns through All-India Radio and other mass media to create archive awareness among the people for salvaging private archives and historical manuscripts.

The Joint Selection Committee of Parliament on the Lokpal and Lokayuktas' Bill, in its report presented to Lok Sabha on March 26, has recommended exclusion from its purview the offices of the Prime Minister, the judiciary, and Secretariats of Parliament, Legislative Assemblies of Union Territories and Metropolitan Council of Delhi. With a view to enabling the Lokpal or the Lokayukta to concentrate on really important cases when the work becomes unmanageable, the Committee has suggested that the Central Government should be empowered to exclude by notification, on the recommendation of the Lokpal, complaints against public servants belonging to such class (not being public servants holding posts carrying a minimum monthly salary of one thousand rupees or more exclusive of allowance) as may be specified in the notification. The

Committee has also proposed that the existing provision in the Bill for the re-appointment of the Lokpal and the Lokayukta for a second term should be deleted. This will help avoid the risk of a person being retained for a longer period even when more suitable and competent persons are available.

The Kerala State Assembly approved on January 10, 1969, the Kerala Official Language (Legislation) Bill, 1968. In addition to English, Malayalam will henceforth be used in Bills, Acts, Ordinances, etc.

The Central Social Welfare Board, set up by a Government Resolution in August, 1953, has been registered as a Company under the name of "The Central Social Welfare Board". This change has been effected following the repeated criticism of the Public Accounts Committee that payment of grants by the Government of this body were being made without its legal entity.

The Government of *Haryana* has set up a Transport Advisory Committee to examine the question of nationalization of road transport improving travelling amenities and working conditions of the staff. The Committee is headed by the Chief Minister.

In pursuance of the recommendations of its Administrative Reorganization Committee that the State Printing Department should function on commercial lines, the Government of Maharashtra have issued orders that the Department should charge all the government agencies for their printing work (except for routine items) on the basis of a standard schedule of printing rates.

* * *

The Union Public Service Commission will introduce from October 1969 regional languages as media for examinations conducted by it. To start with, however, candidates will be allowed to answer papers in any of the languages (listed in the Eighth Schedule of the Constitution) in two subjects only, namely, essay and general knowledge. So far in the optional papers, only Hindi was allowed as a subject. From this year other regional languages have been added which can be offered as an optional subject.

The Government of India has, under the provisions of services conduct rules, prohibited all its servants from using their position or influence directly or indirectly to secure employment for members of their family or their dependent in any private company having official dealings with the Government. Second marriage by women employees has also been prohibited.

The Central Government have decided to amend the retirement rules to provide for the retirement on three months' notice, on attaining the age of 50 years or thereafter if it is necessary to do so in public interest, of Central Government servants in Class I and II Services (other than those in posts for which direct recruitment is made at the age limit of 25 years and above). It will also be open to this category of employees to retire voluntarily at/after 50 years of age. Similar compulsory retirement and option to retire voluntarily after completion of 30 years of service, will be allowed in the case of Central Government servants in Class II Services posts which are not governed by any pension rules.

In the case *Railway Board vs. Mr. Niranjan Singh*, the Supreme Court of India held that there was no fundamental right for any Government employee to hold a meeting on the premises of a Government office.

The National Council of the joint consultative machinery has agreed to the extension from 10 to 20 days in a calendar year of the special casual leave admissible to office bearers of recognized associations/unions of Central Government employees for participation in associational activities. Special casual leave up to 10 days in a calendar year will be admissible in the case of out-station delegates and upto 5 days for local delegates. It has also been that the chief executive of the association/union/federation or, if the chief executive is not defined clearly, the general-secretary may be brought on transfer to the headquarters of the appropriate administration.

The *Government of Bihar* has set up a Committee to report on the strength of the State Health Services of different categories, the desirable rate of expansion of each cadre, the desirability of separating the teaching cadre from the general cadre and the expansion of medical colleges and hospitals.

A Committee to review the existing facilities available to students in Maharashtra for preparing for the IAS and other all-India competitive examinations has been appointed by the *Maharashtra State Government*. It will study in detail the causes for lack of adequate participation by students from Maharashtra and the small number of students passing the IAS/IPS and other similar all-India competitive examinations.

In *Punjab*, pension rules have been amended to remove the distinction between the substantive pay and officiating pay for the purpose of calculating pensions and gratuity. Subject to certain conditions, all service rendered in pensionable establishment, interrupted or continuous, shall be treated as qualifying service, and the periods of break omitted while working out aggregate service. The amount of pension will be determined on the average of emoluments of last 24 months' service instead of 36 months as at present. In the case of retiring non-gazetted employees, the pension sanctioning authorities will be authorized to pay them an anticipatory pension upto 75 per cent of the pension amount through establishment bills, till the issue of pension payment order for anticipatory/final pension by the Accountant General.

The Government of *Uttar Pradesh* had laid down a uniform policy in the matter of allowing its employees, both temporary and permanent, to apply for posts outside their parent office/department. A Government servant will be given only three chances during his entire service of applying for outside posts and this facility will be available to a gazetted officer only during the first five years of his service or till his attaining 30 years of age. Permission shall not be granted to apply for any post in the private sector. Personnel of the State Medical and Health Services will not at all be allowed to apply for outside posts.

* * *

The Government of India announced on March 22, its acceptance of the several recommendations made by the Administrative Reforms Commission in its report on "Finance, Accounts and Audit". These include:

ntroduction of performance budgeting; setting up a team of officers to undertake a review of Heads of Account and Heads of Development adopted for Plan purposes; advising Ministries/Departments that underspending in one year would not prejudice the budget estimates for the next year; a total ban on the inclusion of lump sum provisions in the budget; amending the Contingency Fund of India Act to facilitate financing of urgent projects out of it; making it obligatory for each Ministry or a group of Ministries to have a whole-time Internal Financial Adviser; completion of all formalities connected with the sanction of the pension well before the last month of service of an employee; and appointment of expert committee for detailed examination of feasibility of introducing modern data processing techniques within the accounting system.

The Government have also accepted the recommendation of the Administrative Reforms Commission made in its report on Public Sector Undertakings) for setting up of Audit Boards for both regularity and propriety-cum-efficiency audits, for specific sectors of public enterprises. The present audit by the statutory auditors will also continue under the egis of the Audit Boards. The Boards will be a part of the organization of the Comptroller and Auditor-General.

In pursuance of the policy statement on social control over commercial banks made in Parliament on December 14, 1967, the *Government of India* have set up a Banking Commission with *Shri R. G. Saraiya* as Chairman. The Commission will enquire into the structure of the existing commercial banking system and the cost and capital structure; review the current arrangements for manpower planning, recruitment and training of bank personnel, the working of cooperative banks, indigenous banking agencies and non-banking financial intermediaries; examine the existing legislative enactments relating to commercial and cooperative banking; and make recommendations for improving and modernising the operating methods and procedures and the management policies of commercial banks.

Following the recommendations of a Working Group on the subject set up by it, the Central Government have established a National Institute of Bank Management. The main functions of the Institute are: (*a*) formulating broad strategy of education, training and research programmes for effective implementation of national banking policies; (*b*) conducting educational and training activities for the high level banking personnel not catered to by the existing institutions; also undertaking industry-wide research activities; (*c*) dissemination of information on bank management know-how; (*d*) reviewing the impact of training and research activity in the banking sector from time to time and recommending ways of filling the gaps by such further programmes as may be necessary.

The Institute will conduct orientation and appreciation programmes, integrated programmes in management skills and functional programmes. It will also provide guidance to individual banks in matters, such as, measurement tests for employee selection, morale and productivity studies, streamlining organizational structure, and evaluation of training and management development programmes.

The Kerala Taxation Enquiry Committee (Chairman: *Dr. M. J. K* Thavaraj, IIPA) has recommended that basic approach of a progressive

tax policy should be to shift the emphasis from a commodity-based to progressive and flexible group of taxes designed to tap more intensively land and the income and wealth arising therefrom. Another important recommendation is that the Centre should take the requisite initiative in exploiting for the benefit of the States all the taxes enumerated in Article 269 of the Constitution. The Committee has urged that the Finance Commission should be a permanent body and that the scheme of devolution of taxes should be more rational and comprehensive, covering the developmental requirements also. In addition to making a number of suggestions on flexibility, equity and rationalization in taxes and additional resource mobilization, etc., the Committee has suggested that a properly strengthened and developed National Development Council would be the most convenient forum for high level decision-making on all issues of national importance in planning and policy-making for development. For settling other outstanding inter-State problems an Advisory Council may be constituted under Article 263 of the Constitution.

The Indian Council of Mayors, which met at Baroda on December 28-29, 1968, recommended that a municipal finance commission be appointed in various States every five years with the prime aim of making local bodies self-reliant. It further urged that the Central Government should set up a revolving fund of about Rs. 200 crores for the development of urban areas, provision of essential infrastructure facilities and improving urban community life.

The *Government of India* have set up a Council of Social Science Research as an autonomous organization. Composed of eminent social scientists from Government, universities and specialised research institutions or associations, the Council will, among others, review the progress of social science research, tender advice to its users in Government or outside, and sponsor social science research programmes and projects.

The *Government of India* has decided to set up a National Committee on the Status of Women to examine the working of the constitutional and administrative provisions having a direct bearing on the education, employment and social status of Indian women.

The *Government of India* has decided to establish a State Farm Corporation to take over the departmentally-run mechanised farms in Rajasthan, Orissa, Haryana and Mysore. With an authorised capital of Rs. 7 crores the Corporation, besides setting up agricultural farms for seeds, fibre crops, plantations, etc., will also develop, reclaim, and improve land for agricultural purposes.

A six-man Irrigation Commission, headed by *Shri Ajit Prasad Jain, M.P.*, has been set up by the *Government of India* to go into the question of future irrigation development in the country in a comprehensive manner.

Pursuant to the recommendations made in the Report of the *Jammu & Kashmir* Commission of Inquiry (Chairman: *Dr. P. B. Gajendragadkar*), the State Government has appointed a Committee to draw up a list of Backward Classes in the State of Jammu and Kashmir on the basis of criteria relating to economic, educational and social backwardness. Another Committee headed by the Chief Secretary, Shri P. K. Dave, will examine the Commission's recommendations regarding

regionalisation of cadres and the setting up of regional and district recruitment boards.

For the purpose of ensuring prompt enquiries into complaints of exploitation of property of tribals, the *Madhya Pradesh* State Government has set up a committee in each district with the Collector as its Chairman.

In order to safeguard the interests of the local people in regard to the employment in the State Services, the *Government of Nagaland* have since issued directives to all Departments under the Government as well as the Nagaland Public Service Commission to reserve 80 per cent of all categories of posts for the Nagas residing within Nagaland and in the neighbouring State of Manipur.

Greater involvement of the Panchayati Raj institutions in the implementation of land reform measures has been suggested by a Study Team (*Chairman*: *Shri V. Ramanathan*) appointed by the Department of Community Development of the *Government of India* in December, 1967. The Team recommends that Panchayati Raj institutions should be associated with the maintenance on land records and management. It has also suggested that a watch-dog functional sub-committee should be set up in each Panchayat to look after such items of land reforms which impinge on the interests of the weaker sections of the community.

In line with the recommendation of Santhanam Committee on the manner of Panchayat elections, the *Government of U. P.* has made provision for secret ballot in elections to the office of a Pradhan or Up-Pradhan of Gaon Sabha or a member of Gaon Panchayat by amending the U.P. Panchayat Raj Act, 1947.

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During the months December 1968—April 1969, the Administrative Reforms Commission submitted four reports to the Government: (1) Life Insurance Administration (December 10, 1968), (2) Central Direct Taxes Administration (January 6, 1969), Administration of Union Territories and NEFA (January 28), and Personnel Administration (April 18). In its report on "Life Insurance Administration" the ARC urged the institution of a special policy suited to rural areas, appointment of a special Agent to look after cluster of villages, elimination of delays in settling claims; delineation of the functions of the Development Officers; setting up of branch offices at every district headquarters and delegation of more authority and functions to the branches; concentration by the divisional offices on coordination of activities; abolition of zonal offices; and constitution of an Advisory General Council, composed of members of the LIC, experts in industrial, commercial, financial and administrative fields and representatives of the Policy Holders Association and life insurance agents federation.

In its report on "Central Direct Taxes Administration" the ARC has suggested simplification of income-tax laws and procedures for cases involving higher income. It has proposed summary methods of disposal of small income cases. As regards uncollected taxes, the Commission has recommended a programme of an expeditious write-off of irrecoverable demands on the basis of recommendations of reviewing bodies. About the Income-tax Act, 1961, and the confusion created by subsequent over 400 amendments, the Report has suggested: (*a*) amendments to tax laws should be made only after a careful survey of their total effect by all concerned; and (*b*) before rules are amended or new rules framed, the views of the Commissioners of

Income-tax and of leading professional or trade and industrial bodies should be ascertained and considered. Regarding the problem of tax evasion, the Report, apart from urgent severe punishment, recommends the building up of an effective system of collecting and disseminating information relevant for the purpose of making assessments, *e.g.*, strengthening of Special Investigation Branches, proper supervision of their working and revival of external survey. In addition, certain legislative measures have also been recommended.

The Working Group set up by the ARC on the subject had suggested that the Central Board of Direct Taxes should be re-constituted as purely an executive authority without any responsibility for advising on policy. The ARC, however, finds that it would be unrealistic to exclude the head of the Board from advising on policy. The Commission has agreed with the Working Group that, in future, direct recruitment to Class II of Income-tax Officers should be stopped. It has also favoured the proposal for designating Class I Income-tax Officers as "Senior Income-tax Officers" and for imparting of one month's training in judicial practice and procedure to Income-tax Officer on their promotion as Assistant Commissioners.

In its report on "Administration of Union Territories and NEFA", the Administrative Reforms Commission has suggested that the Administrator of each Union Territory should, as a representative of the Central Government, be invested with powers and authority to take decisions on the spot and with speed. He should have full disciplinary powers over all services of the territory. The Territorial Assembly should be empowered to function in a manner similar to that of a State Legislature. The Administrator should be authorised to exercise in appropriate cases the powers of the President to give assent to Bills. The Central non-Plan financial assistance to be available to the Union Territories with Legislatures should be indicated in advance for say, 5 or 3 years, so that the time and labour involved in the multiple scrutiny of annual budgets by the Centre, as at present, is avoided. The Commission has drawn attention to the problem of over-staffing in the Union Territories leading to wasteful expenditure. The temptation to simulate a State in all respects is one of the causes for over-staffing. The administrative pattern of the States need not be imitated or reproduced in the Union Territories which are just comparable in size either to a tehsil or a district. The ARC has accordingly recommended slimming the administrative organization and ministries to their proper proportions, consistent with the size and resources of each territory. For instance, while Himachal Pradesh should continue to have a Lieutenant-Governor, because of its size, the Administrators of other territories should be of the status of Additional Secretaries or senior Joint Secretaries in the Central Government. Only in the case of Delhi, the Administration should be of the status of a full Secretary in the Central Government.

The ARC is of the view that the measure of responsible government already given to the Union Territories of Himachal Pradesh, Manipur, Tripura, Goa, Pondicherry and Delhi, irrespective of what may be said for or against it in each case, should continue. In regard to Union Territory of Delhi, the Commission has favoured the elimination of the multiplicity of authorities and unification of the administrative structure. It has recommended the abolition of Delhi Municipal Corporation and the transfer of its functions to the Metropolitan Council. It

has also made suggestions to make the Metropolitan Council more effective, and has proposed the creation of autonomous statutory bodies for transport, supply of electricity and water supply and sewage disposal.

The Commission favours application of the provisions of the Sixth Schedule of the Constitution relating to the administration of tribal areas of Assam and NEFA. Keeping in view the need for maintaining integrity of each major tribal group, NEFA may be divided into a suitable number of autonomous districts and regions on the pattern of Assam Hill Districts. At the district level, actual implementation of policies, particularly developmental, may be left to the autonomous district and regional councils. Similar provisions have also been recommended for the hill areas of Manipur and the tribal belts of Tripura.

As regards the ARC report on Personnel Administration, a summary of its findings and recommendations appears at pp. 136-59 of this issue.

DIGEST OF REPORT

INDIA, REPORT OF THE ADMINISTRATIVE REFORMS COMMISSION ON PERSONNEL ADMINISTRATION, New Delhi, Government of India, 1969, p. 169.

The Administrative Reforms Commission (ARC) submitted its Report on Personnel Administration to the Government of India on April 18, 1969. Three Members of the ARC (Shri H. V. Kamath, Shri V. Shankar and Shri T. N. Singh) have appended to the report notes of supplement and/or dissent on some specific points. In formulating its recommendations the Commission have had the benefit of the reports of the following 5 study teams set up by it: (1) "Recruitment, Selection, UPSC/State PSCs and Training" (Chairman: *Lt. Gen. S. P. P. Thorat*), (2) "Personnel Planning, Staffing of Public Sector Undertakings and Personnel Management" (Chairman: *Shri R. K. Patil*), (3) "Promotion Policies, Conduct Rules, Discipline and Morale" (Chairman: *Shri K. N. Nagarkatti*), (4) "Machinery of the Government of India and its Procedures of Work" (Chairman: *Shri C. D. Deshmukh*), and (5) "Administrative Tribunals" (Chairman: *Shri S. C. Lahiri*). As it is an important ARC report, the summary of its recommendations, as given in the report itself, is reproduced below. The material taken from the body of the report and the notes of supplement and/or dissent is shown in brackets.

CHAPTER II: THE NEED FOR A NEW PERSONNEL SYSTEM

[(*a*) The nature of governmental tasks has, in the post-Independence era, undergone a marked change. Administration is now directly involved in the formulation of policies and implementation of tasks concerned with social welfare and economic growth. Science and technology, in this nuclear age, have projected new tasks of administration. The new areas of administration that have emerged call for new and special knowledge and techniques. Even in the field of regulatory administration, the emergence of new problems have created difficult situations which require careful and expert handling.]

[(*b*) Government has been aware of the need for change. But the changes so far made have been sporadic and peripheral. The system continues to be set in the same old pattern and lacks dynamism and adaptability to changing conditions. There is still too great a reliance on the 'generalist'. The technical, scientific and other specialist personnel, who have now appeared on the scene, are not participating directly in policy formulation . . . they have remained in separate hierarchies. The top posts have not been brought within the reach of all those who have the capacity to hold them. Above all, there is no clearly conceived and articulated policy of personnel management.]

[(*c*) Unalloyed generalism, with which we have been familiar, is losing its validity in several fields and is progressively declining in importance.

An effort is needed to match jobs with the men possessing the needed qualifications, which means that the preference for the generalist, pure and simple, should give place to a preference for those who have acquired competence in the concerned field.]

[(*d*) The new tasks call at higher levels for a competence which cannot be acquired overnight, but can only be imbibed through special training grafted on to a basic functional skill or academic qualification. Each new area of administration—be it economic, social, industrial, technological, scientific, or agricultural—has its own body of academic requirements, knowledge and techniques. The effective administration of each demands an intimate knowledge of its underlying principles and an awareness of its problems. This knowledge can only come through the study and practice of administration of the relevant area over a long period of time, in some cases at least, long enough in fact, to amount to a commitment—a professional commitment.]

[(*e*) If the technical, scientific and other specialists have not acquired adequately the necessary skills and qualities required for holding the higher administrative and managerial positions in the Secretariat, it is only partly because of aptitude factor, but mainly because they have not had opportunities for working in such positions early enough in their career and their development has not been properly planned.]

[(*f*) The established higher services have pay scales so fixed on the time factor that they induce in the incumbents a complacent feeling of easy attainment of increments. They do not provide for recognition of merit, adequate opportunities for promotions based on such recognition, and for a continuous incentive for good performance. There are shortcomings in the remuneration pattern of the different Services. The most favourable scales are assigned to the IAS and IFS, creating a notion of primacy in matters concerning advancement. In the wake of development and vastly increased activities on the part of Government, varying levels of responsibility have emerged in all the cadres. It has, therefore, now become necessary to rationalize the pay structure and base it on recognizable levels of responsibility in all areas of administration. Since the higher administration has now to draw upon a variety of sources the existing dissimilarity in pay scales would create difficulties in selecting personnel to positions and responsibilities outside their own cadres and some relative uniformity between different scales existing at present must be achieved.]

[(*g*) Though there are provisions for promotion to Class I (all-India and Central) Services from lower ranks, these are not enough, and do not fully recognize the talent that is available in the latter.... Considering the nature of its present task, the Civil Service would vastly improve its performance if better incentives are provided to the meritorious among the lower ranks.]

[(*h*) The existing personnel system needs reform and that reform has to proceed on the following lines: (*i*) A rational system of filling policy-advice positions with men possessing the required qualifications and competence needs to be devised. This will mean a fuller use of different Services for Secretariat work, as also the adoption of special measures to build the needed

specializations in the headquarters personnel. (*ii*) Senior management will need to be selected from all the relevant sources—generalist and specialist and, for this purpose, talent needs to be discovered and developed in all the cadres, specially among those who have not hitherto been inducted into the higher administration to any significant degree. (*iii*) A rational pay structure needs to be adopted so as to reflect actual responsibility borne by each job. (*iv*) In order to tone up morale throughout the personnel system much greater scope than now exists need to be created for talent in the lower ranks to move up to higher positions in the Civil Service, on the basis of competence and performance.]

CHAPTER III : AN OUTLINE OF REFORM—NEED FOR SPECIALIZATION

1. [Each function has become important and needs specially trained and competent personnel who should, normally and for the most part of their career, specialize and stay within a particular function. The term 'functional service' would include not only those 'services' which are charged with a technical function for which a pre-entry vocational education is required (*e.g.*, the various Engineering Services), but also those which specialize after entry in a particular area of administration (such as the Accounts, Income-tax) and for which no pre-entry vocational education other than attainment of a certain level of educational qualification is prescribed. Most of the organized Services of Government are already 'functional' in the above sense. The main exception is the IAS which is a general purpose service.]

(1) The functions of Government have become greatly diversified. Wherever the numbers involved in a particular function are viable, the posts should be grouped into regularly constituted services.

[However, in forming such Services all-India or Central—the functional aspect should be fully borne in mind. There should be reservation of posts for a particular Service only insofar as the qualifications, training and experience of its members make them specially qualified to man the posts; but in respect of other posts, the eligibility should be shared in common with the members of other Services who may be expected equally well to fill these posts after some training and/or work experience, if necessary.]

[If the higher posts in different functional areas are encadred within one Service, as has happened in the case of the IAS posts in the States, qualified and competent persons will not be attracted to all the needed functions.]

[In the changing context, therefore, the old concept underlying the formation and role of the IAS would require readjustment.]

(2) A functional field must be carved out for the IAS. This could consist of Land Revenue Administration, exercise of magisterial functions and regulatory work in the States in fields other than those looked after by other functional Services.

2. (1) All posts in a functional area whether in the field or at headquarters or in the Secretariat should be staffed by members of the corresponding functional officers not encadred in a Service.

   (2) There should be clearly defined schemes for staffing the middle and higher levels in each functional area.

3. (1) Posts of (or equivalent to) Under Secretary or a Deputy Secretary in the Secretariat and the attached offices should be examined and classified as falling (*i*) within functional; or (*ii*) outside functional area.

   (2) Posts of Under Secretary and its equivalent should be filled by officers of the corresponding functional Class I Services. Senior Class II officers, under the Centre as well as the States, in the functional area may also fill these posts. They should normally be employed on a tenure of three years.

   (3) Posts of Deputy Secretary and its equivalent should be filled by officers of the corresponding functional Class I Service (all-India, Central and State) on a tenure, normally, of four years.

4. Posts of Under Secretary not falling in any functional area should be filled by the promotion of the relevant Secretariat and attached office personnel and not by officers of Class I Services, all-India, as well as Central.

5. (1) The posts at the level of Deputy Secretary or equivalent at the Central headquarters, which do not fall within a particular functional area, should be demarcated into eight areas of specialisms as follows:

   (*i*) Economic Administration,

   (*ii*) Industrial Administration,

   (*iii*) Agricultural and Rural Development Administration,

   (*iv*) Social and Educational Administration,

   (*v*) Personnel Administration,

   (*vi*) Financial Administration,

   (*vii*) Defence Administration and Internal Security,

   (*viii*) Planning.

   (2) Selection should be made from among all Class I officers to man these posts. After 8 and within 12 years of service rendered in a functional area, every Class I officer directly recruited to a Class I post—all-India or Central—should be eligible for the selection. Promotees to Class I should be eligible for selection if they have spent a minimum period of five years in Class I and have not completed 8 years therein.

   [Persons selected for the eight areas of administration indicated above will be concerned with policy and management to a greater extent than those at similar levels in the purely 'functional'

areas. Also, they will need to stay longer in the different specializations, so that full advantage may be reaped out of the growing expertise. They should constitute a policy and managerial pool, which will be available to the Centre for a fairly long period and which should partly feed the senior management of the Government of India in the relevant areas.]

(3) Selection will be made by a committee consisting of the Chairman, UPSC, and two senior Secretaries on the basis of a written test, an interview and an assessment of the previous records. [The written test should not be of an academic character. It should aim at an assessment of the officer's capacity for communication, clarity of thought, overall management ability, power of analysis and comprehension of current social, economic and political questions. The test should be so designed that neither the generalist nor the specialist is placed at a disadvantage *vis-a-vis* the other.]

(4) After selection and before being appointed to the post of Deputy Secretary or equivalent at the Centre, they should undergo a period of training described in Chapter VII. They should be deployed in eight areas of specialization: (*a*) economic, (*b*) industrial, (*c*) agricultural, (*d*) social and educational, (*e*) personnel (*f*) financial, (*g*) defence and internal security, (*h*) planning.

(5) The tenure of appointment for these Deputy Secretaries should be six years excluding the period spent under training.

6. (1) Senior management posts in functional areas should be filled by members of the respective functional Services.

(2) Senior management posts outside the functional areas should be filled by officers who have had experience as members of the policy and management pool in one of the eight specialisms. They should have completed not less than seventeen years of service.

[The personnel so selected for senior management should be deployed in posts/areas with due regard to their previous specialized experience . . . . At the level of Joint Secretary and Additional Secretary in senior management outside the purely functional posts, the areas of specialisms will broaden out and it should be possible, and it is necessary to provide for mobility from one specialism to an allied specialism. At the highest level of Special Secretary or Secretary and equivalent in the Central Government, the factor that should count most is one's general managerial competence.]

[In emphasizing the need for specialization and, what is more, the need for specialized skills in the higher administration, it is not, by any means implied that the generalist is wholly redundant or superfluous. The fact to be highlighted is that certain posts and categories of posts can no longer be regarded as the close preserve of generalist cadres alone. This does not, however, mean that the generalist is obsolescent or becoming

obsolete at all levels. The generalist has his place, and an important one at that, in the scheme of things; but so has the specialist, the scientist, and the technologist.]

(3) The selection for senior management posts in the functional areas as well as outside the functional areas, will be made by a committee consisting of the Cabinet Secretary, the Secretary of the Department of Personnel, and one of the senior Secretaries. There should be no fixed tenure in senior management posts.

7. The Department of Personnel should be responsible for working out the detailed implications of our recommendations for staffing the higher posts in administration.

* * *

[In a separate note, one of the ARC Members, Shri V. Shankar, though agreeing generally to the scheme of reforms recommended, points out that the scope for a specialist in the present administration has been over-emphasized. "Ultimately, whether we take the functional or non-functional areas, the need is that of persons who have sufficient objectivity and general managerial competence, can rise above the narrow fields in which they would generally be working most of the time and can do adequate justice to the entire field of scientific or technological administration." Shri Shankar also does not subscribe to the view that in decision-making the scientist or the technologist is being ignored or is not having an adequate voice.]

[In his note of dissent, another Member, Shri T. N. Singh, while not generally objecting "to the classifications in regard to functional services and specialisms", observes that some of the recommendations would lead to rigidity in the matter of manning and functioning of these functional services, particularly at higher levels. He agrees that "technicians like engineers and doctors should hold top posts in their corresponding departments" but does not think that "this principle must invariably be applied in the case of departments 'outside the functional area' ". For ensuring objectivity and fearless advice, the officers of the Central Statistical Organization and the Directorate General of Technical Development "are not and should not be expected to take decisions as other executive officers". Further, according to him, "some of the functional areas are not so functional in the strict sense of the term". Conceding that the scope for the IAS is bound to be reduced with the induction of specialists in larger numbers, Shri Singh considers that the ARC has "unduly restricted the field of IAS officers", and it needs to be widened. He adds, "many of the IAS officers have had a very good background of work and experience in socio-economic problems. To exclude them completely from certain socio-economic Departments described as functional will not be proper". The ARC scheme for manning of middle-management posts outside the functional areas, Shri Singh feels, "will, in practice, mean creation of a new pool and inter-change may not be possible between the field and the Secretariat, notwithstanding such a provision in the scheme." He finds it unfair that the Class I Officials in the State Services have been left out from the area of selection to the pool and feels that the inclusion of these officers possessed of real field experience, will bring about a fresh outlook and help in realistic decision-making.]

[Both Shri Singh and Shri Shankar have opposed the ARC proposal for holding of a written test for entry into middle-management positions outside

the functional areas. Shri Singh considers that such a test "is likely to be unfair to the officer who has worked for a number of years in the field as against others". Shri Shankar thinks that the written test proposed is uncalled for, "at least for the members of the All-India Services". "It would be a reflection on the quality of persons that would be recruited for the All-India Services."]

CHAPTER IV : UNIFIED GRADING STRUCTURE—ITS IMPORTANCE TO PERSONNEL MANAGEMENT

8. The existence of a multiplicity of scales of pay for different groups neither makes for a rational system of remuneration related to work content (*i.e.*, based on the principle of equal pay for equal work), nor does it facilitate the selection and mobility of personnel from different Services for higher positions, nor programmes of career development.

(1) The posts in the Civil Service should be grouped into grades so that all those which call for similar qualifications and similar difficulties and responsibilities are grouped in the same grade. The number of such grades may be between 20 and 25.

[In carrying out such an evaluation in those Services which have field as well as headquarters posts like the all-India Services (technical as well as non-technical) and many of the Central Services (technical as well as non-technical), the liability for service all over the country should be reflected in the pay pattern and grading system that may be adopted.]

(2) All the Class I posts may be evaluated and assigned to, say, 9 common pay scales, an illustrative chart* which is attached at the end of this chapter. (Some examples of posts which could be fitted into the grades are also given in this chart. The details given are only by way of illustration and with a view to indicating general line of thinking.) These nine grades or pay scales may be divided into three levels, namely, junior, middle and senior. The progress of an officer of an established Class I Service among the grades within each level should be on the basis of proved performance. Promotions from the junior to the middle level and from the middle to the senior level should be by selection.

[If the grading scheme, as proposed, is brought into existence, it will help remove the current impression that the headquarters posts are more important than field posts. Further, it will become unnecessary to attach special pays to certain posts as at present.]

[The posts of District Collector and the District Superintendent of Police should be held by experienced and matured officers and for longer periods than at present.]

(3) The Department of Personnel should undertake urgently a detailed study for the purpose of determining the grades as well as the posts to which they should be attached.

*Not reproduced.

9. After all Class I posts under the Centre and those to be manned by the all-India Services in the States have been evaluated and allotted to the various grades, other posts at the Centre as well as in the States be taken up for examination and the entire Civil Service brought into a framework of 20 to 25 grades.

[The proposals in Chapter III stand by themselves, and are not to be considered as depending upon the implementation of the reform of the pay structure proposed above.]

CHAPTER V : RECRUITMENT POLICY

10. (1) For all Services advance projections should be made of the requirements of personnel for five years at a time. Mid-term appraisal also should be made if circumstances warrant it and necessary correctives made on the basis of the appraisal.

 (2) Such projections should be made by cadre management committees which should be constituted in the manner described in para 5.

11. (1) The recruitment to Class I Engineering posts should, as far as possible, be made only through competitive examination, and the selection after a simple interview should be restricted to cases where some prior experience or special qualifications other than the basic degree are required or where new projects are to be undertaken at short notice.

 (2) For the Indian Administrative Service/Indian Foreign Service and other non-Technical Class I Services, recruitment should be made only through a single competitive examination, it being left to the candidates to express their order of preference for the different Services.

12. The subjects to be offered at the combined competitive examination for non-technical Services may include Engineering subjects as well as subjects relevant to a medical degree.

13. A committee should be set up to go into the questions of devising speedier methods of recruitment, in general, of bringing down the proportion of candidates to posts, of reducing the expenditure on publicity, and of revising the syllabus of the examinations for the higher Services.

 [Shri T. N. Singh, in his note of dissent, recommends the appointment of a committee to suggest such changes in the recruitment system as will remove its present anti-rural bias and provide "largest measure of opportunity to our youngmen living even in remote parts of India to get into the services".]

14. (1) The upper age limit for entrance to the competitive examinations may be raised to 26.

(2) The total number of chances a candidate can take for the technical as well as the non-technical Services (both inclusive) should be restricted to two.

[Shri H. V. Kamath, however, feels that the upper age limit should be 25 (and not 26) and there should be no restriction on the number of chances a candidate can take within the prescribed age limits.]

[The number of first class graduates appearing for the competitive examinations is too small in comparison with the number of such graduates turned out each year.]

15. (1) A special competitive examination for non-technical Class I Services may be held for first class graduates who have an aggregate of not less than 60 per cent marks either at the first degree or the Master's degree. [This examination different from the traditional type may be held for attracting persons with high academic record. This examination would not call for an elaborate post-collegiate preparation but would aim at tapping the most intelligent of the first class graduates. The examination may be on the lines of what is known as 'Method II examination' conducted for recruitment to the Administrative Class in the United Kingdom.]

(2) The examination should consist of a written test of a non-academic type followed by an oral test conducted by a screening board. Final selection should be made by the UPSC. The screening board should be presided over by a member of the UPSC and have at least three other members one of whom should be a psychologist with experience of personnel testing techniques. The other members may be civil servants (retired or in service) or reputed men belonging to the learned professions.

(3) This method should be adopted initially only on a small scale and on an experimental basis. It should be restricted to the selection of candidates for 10 per cent of available vacancies. After the method has been tried for three years, a review should be made of its working. If the review shows that the method has produced satisfactory results, its scope may further be expanded. Otherwise, it may be modified or even discontinued.

16. In order to provide greater opportunities for the advancement of talented persons who are not already in Class I:

(*a*) the quota of vacancies in Class I to be filled by promotion may be increased up to a maximum of 40 per cent where the existing quota falls short of that percentage;

(*b*) Every one who has completed 6 years of service in Government and is less than 35 years of age may be given one and only one chance to sit for the open competitive examination for Class I non-technical services, irrespective of the chances already taken, provided that he fulfils conditions relating to educational qualifications.

17. Provision should be made for appointment to technical posts at the senior levels of persons of proved competence from universities and industrial and commercial concerns, etc., if the capabilities and expertise possessed by them are needed and are not available within the ranks of the Civil Service. Care should be taken to regulate the seniority of the lateral entrant on objective criteria. This assessment as well as the selection should be made by a committee presided over by the Chairman of the UPSC.

18. (1) Direct recruitment to Class II posts of Section Officers may be stopped and these posts may be filled by promotion of Assistants whose direct recruitment, however, will continue.

    (2) Direct recruitment to Class II posts whose incumbents perform duties similar to those allotted to Junior Class I officers may be abolished. Such posts may be filled entirely by promotion.

[Shri T. N. Singh, however, considers that the "promotion quota for the orresponding State Services in the All India Services should be increased to 0 per cent", in view of the fact that the Provincial Civil Service and the rovincial Police Service will, by and large, continue to be recruited irectly.]

19. For recruitment to clerical and repetitive jobs not calling for any special skill, simple objective tests may be devised and adopted in place of the essay type of examination or where no examinations are held at present.

20. [There should be a greater measure of promotion to the all-India Services from the eligible State Services. As recommended earlier, Class II officers from the States should be considered for posts of Under Secretary in the Central Secretariat in the functional areas.]

    There should be a provision for recruiting from the personnel of the State Governments for Central posts in organizations like the Secretariat, and the Departments of Agriculture and Education, etc.

[In his note of dissent, Shri T. N. Singh points out that "unfortunately ne Secretariat at Delhi in recent years, particularly at the junior and even at he middle management levels, has been manned by people who have largely esk experience only. It is almost invariably so in the case of officers at unior levels. The Class II officers working in Delhi and the Central Secreariat who initially are recruited as Class III officers get the bulk of these jobs." He adds, "this dominance of the desk workers and the urban-oriented officers n Delhi must be radically altered if we are to have an administration with a eal capacity to understand the common man's needs and desires". Referring o the ARC proposals for staffing of middle management posts outside the unctional areas, Shri Singh observes, "it is rather anomalous that while in he case of Under Secretaries senior Class II officers belonging to the States hould be eligible for promotion, in the case of Deputy Secretaries, Class officers of the States are excluded." The ARC has "unwittingly given reater advantages to the desk workers as against officers who are or have

been field workers, so far as junior and middle management groups are concerned". Shri Singh urges that the ARC scheme of staffing, promotion and selection to junior and middle management groups, be altered so as to enable officers with field experience in the States and at the Centre to occupy positions at junior, middle and higher management levels. There should be as much traffic between officers of the States and the Centre as possible.]

CHAPTER VI : RECRUITING AGENCIES

21. (1) In making appointments to a State Public Service Commission, the Governor should consult the Chairman of the Union Public Service Commission and the Chairman of the State Public Service Commission. (The latter may be consulted also with regard to the appointment of his own successor.)

(2) In making appointments to the Union Public Service Commission, the Chairman of the Union Public Service Commission should be consulted (even with regard to the appointment of his own successor).

(3) Not less than two-thirds of the membership of the Union Public Service Commission should be drawn from among the Chairmen and Members of the State Public Service Commissions.

(4) At least one of the Members of a State Public Service Commission should belong to a different State.

(5) The minimum academic qualification for membership of a Commission should be a university degree.

(6) A Member selected from among Government officers should have held office under a State Government or the Central Government for at least ten years, and should have occupied the position of a head of department or Secretary to Government in a State, or a post of equivalent rank under the Central Government, or a comparable position in an institution of higher education.

(7) Members selected from non-officials should have practised at least for ten years in any of the recognized professions like Teaching, Law, Medicine, Engineering, Science, Technology, Accountancy or Administration.

[In a separate note Shri Kamath recommends that the retirement age of the members of the State Public Services should be raised from 60 to 62. He also points out that at present "there is no effective constitutional safeguard against a wanton erosion of the conditions of service of the Chairman and Members of the Commission over a period of time". He, therefore, favours the regulation of the conditions of service of the Chairmen and Members of the Union Public Service Commission and the State Public Service Commissions by an Act of Parliament or of the State Legislature concerned.]

22. Government's decisions on the exclusion of certain matters from the purview of consultation with Public Service Commissions should be taken after consulting the Commissions.

23. (1) Wherever possible, different departmental authorities should pool their requirements of non-technical Class III and Class IV personnel who are directly to be recruited, and make a joint recruitment.

    (2) Recruitment Boards should be constituted for technical appointments in Class III and Class IV and should consist of senior officers representing the Department concerned, as well as some other technical Department.

24. (1) The UPSC should be associated with the selection of personnel to, and their promotion within the quasi-government bodies entirely or substantially financed by Government.

    (2) In the case of smaller organizations, the function of the UPSC should be to approve the regulations governing recruitment and promotion, including the constitution of Selection Boards and Promotion Committees.

    (3) In the case of bigger organizations like the CSIR, however, only broad personnel policies need be framed in consultation with the Commission, the details of selection and promotion being left to the organization itself.

    (4) In all cases, the UPSC should develop an adequate system of reporting and inspection to ensure that at least minimum standards are observed in selection and promotion. The Commission may recommend, at their discretion, the annulment of selections and promotions falling short of such minimum standards.

    (5) Comments, if any, by the UPSC on the working of these arrangements should be incorporated in its annual report to be placed before Parliament.

    (6) Powers similar to those proposed for the UPSC, should vest in the State PSCs *vis-a-vis* quasi-government institutions which are either entirely or substantially financed by the State Governments.

25. (1) The staffing of the Secretariat of the Commissions should become diversified and should aim to include persons with wide experience in education, scientific fields and practical consideration.

    (2) Research cells should be set up in the Public Service Commissions to assess the effectiveness of recruitment by follow-up studies and to analyse trends in the skill market and in the educational sphere and to provide data for determining the recruitment policies.

CHAPTER VII : TRAINING

26. [Training should prepare the individual civil servant not only for performing his present job well, but also for shouldering higher responsibilities and meeting new and complex challenges in future.

The aim should be to train civil servants not just for the needs of tomorrow but even for those of the day after. If training is to be effective, it should, as far as possible, also help the individual civil servant to so develop his capacities—mental, normal and spiritual—as to instil in him a sense of dedication.]

Government should, with the assistance of experienced administrators and experts in training techniques, formulate a clear-cut and far sighted national policy on civil service training, setting out objectives and priorities and guidelines for preparation of training plans. [Such a policy should clearly lay down that those with the best potential for development would be selected for training and not those who are easily available.]

27. The Central Training Division should be located in the new Department of Personnel. The Division should have the following main functions:

Leadership:

— promote, coordinate and facilitate training
— formulate policies, regulations and procedures on training and oversee their implementation
— advise Ministries and Departments on:
determination of training needs
instructional techniques evaluation of training programmes

Services:

— arrange for courses in subjects such as management that are a common need
— arrange for training overseas
— arrange for preparation of training materials and research on different training methods
— train training coordinators.

28. Each Ministry or Department, having a sizable programme of training, should have a separate training cell, located in its Chief Personnel Office. It should be manned by a Training Coordinator on a full or a part-time basis, as appropriate, and a few staff aides.

29. (1) The scope of the foundational course at present given by the National Academy of Administration should be extended to cover also technical Class I Central Services and all all-India Services.

(2) The content of the foundational course should be suitably revised to improve its usefulness and lay added emphasis on building proper values and attitudes among the trainees and inculcating in them a sense of dedication to duty and service-orientation. The need to abstain from intoxicating drinks should be emphasised.

[The training must include discussions and discourses on moral standards and spiritual values. It is further desirable to commence each day's work with a suitable prayer.]

(3) Every trainee should live in a village at least for a fortnight to acquaint himself with rural life and conditions.

[The trainees should also be made sensitive to the standard of living of the overwhelming section of the people in the country so that they may not fall victim to "luxury-mindedness" which would distort their sense of values and alienate them from the common run of Indian humanity.]

[Shri Shankar, however, has strong reservations in regard to what has been proposed with a view to inculcating at the age of 22 and within a short span of a year in the selected persons certain ethical and spiritual values for high human endeavour. He is doubtful whether in the training period it is necessary to concentrate on the virtues of abstinence from intoxicating drinks.]

[He further feels that the ARC exhortation concerning avoidance of luxury mindedness by the trainees "is quite unnecessary". "What was luxury of yesterday may be comfort of today and necessity of tomorrow."]

[Shri T. N. Singh, on the other hand, pleads more strongly than the ARC for instilling into the minds of the trainees the desirable concepts of selfless-service and patriotism. He points out that an environment of westernism is prevalent in our administrative training colleges. "Mere provision for occasional lectures on moral and spiritual subjects or recitation of verses from our old religious scriptures will not help".... "Every entrant to Indian way of life and be in a position psychologically and otherwise to mix freely without inhibitions among the people whom he is expected to serve." Shri Singh suggests that the training institutions should be headed by non-officials having to their credit a distinguished record of selfless-service.]

(4) The Government should set up a small committee of leading non-officials, experts and experienced civil servants to revise the scheme of the foundational training on the above lines.

30. (1) The post-foundational institutional training should be entrusted to a seperate staff college for the IAS.

(2) The National Academy of Administration should be responsible for the foundational course for Class I Central Services and all-India Services and for middle management training.

(3) The Academy should be under the new Department of Personnel and its directing staff should be drawn from different Services.

31. The proposals for sandwich pattern of post-foundational institutional training for the IAS under the consideration of the Government, should be finalized and implemented early. Such a sandwich pattern of training should normally be followed in all programmes of probationary training of other Class I Services.

32. The compulsory training of horse riding for the IAS may be scrapped. Training in jeep driving and motor mechanics should be imparted when the Academy shifts to Delhi.

33. (1) The Central Government should evolve a common pattern of field training for IAS probationers, which may be adopted by the States with modifications suited to their local conditions. During their training in the States, the IAS probationers should be assigned to carefully chosen senior Collectors who are known for their interest in training and whose methods of work are considered worthy of emulation.

    (2) For Class I Services other than IAS, training institutions may be set up where they do not exist, if the number of trainees is large enough.

34. A refresher training course for Under Secretaries from the CSS Cadre and a 12-week training course for other Under Secretaries may be formulated.

35. (1) Training for middle-level management in the Secretariat (for Deputy Secretaries and other officers with equivalent status) should have the following three broad elements:

    (*a*) training in headquarters work;

    (*b*) special courses in each of the eight broad specialisms; and

    (*c*) sub-area specialism training.

    (2) Training in policy and planning should be provided as a part of training for all specialisms.

    (3) The responsibility for arranging middle management training programmes should rest with the National Academy of Administration. The special courses in the eight specialisms should, as far as possible, be farmed out to professional organizations which have the needed expertise. [*e.g.*, the Institute of Economic Growth, the Institutes of Management (at Ahmedabad and Calcutta) and the Administrative Staff College, Hyderabad, the Indian Institute of Public Administration and the Defence Services Staff College.]

36. [At the entry level to senior management, what is needed is not formal training but opportunities for self-study with a measure of guidance, exposure to discussions at a high professional level, and a deep study of a few chosen policy problems in the broad area of work. All probable entrants to senior management should take a programme of advanced study for 16 weeks which will help prepare them for higher responsibilities.]

    (1) Senior management education and preparation should be largely oriented towards policy-making, programme planning and review, and problem solving. It should be divided into two

parts: (A) A general study and orientation supplemented by group discussions, seminars and syndicates [with the object of: (*a*) englarging the ability to examine a problem realistically in the broader context of the national goals, Five-Year Plans, and inter-relationships between the community and the Government, and (*b*) increasing the capacity for coordinating diverse programmes into an integrated whole, developing controls and information system]. (B) Specific studies of a set of policy problems or a detailed study of the entire policy-making process in a segment or area of administrative activity.

[The development of different abilities and skills needed at the senior level requires an atmosphere which does not inhibit critical thinking and is conducive to problem-solving. Preparation for senior management also calls for close inter-action with senior administrators, political executives, people's representatives and distinguished scholars in different subjects. Therefore, education and preparation for senior management should not be entrusted to a government institution.]

(2) Persons who are marked out for senior management should be attached to professional institutions for pursuing the programmes of advanced study. Part A of this programme may be arranged with the assistance of the Indian Institute of Public Administration; and Part B at other institutions like the Institutes of Management at Ahmedabad and Calcutta, Administrative Staff College, Hyderabad, the Institute of Economic Growth, etc., which specialise in the area which would be of interest to the official concerned.

37. A programme of refresher courses should be drawn up for each functional service group by the cadre administering authority with due regard to actual needs and the career development plans which are evolved.

38. [Class III and Class IV employees constitute about 98 per cent of the Central Government personnel. Class III employees, whose work is mainly of a routine character, however, render great assistance in implementing policies and programmes in the field.]

A review should be made of existing facilities for training available for Class III and Class IV staff and of the actual training needs, and a phased programme for improved training for these categories of personnel should be drawn up. Such training should aim at not only improving job skills but also developing proper attitudes towards the public.

39. The Central Training Division should arrange for appropriate research on various training methods and experimentation in techniques. It should also promote the development of training materials by various training institutions and professional organisations.

In this programme, high priority should be given to preparation of clusters of cases on various aspects of administration.]

CHAPTER VIII : PROMOTION POLICY

40. Departmental Promotion Committees should be constituted, wherever they do not exist now, for appraising the merits of the persons concerned for promotion. The Chairman of the Departmental Promotion Committee should be an officer at a sufficiently high level. One of the members of the Committee should be an officer from a Department not connected with the one in which promotions are considered.

41. (1) At the end of each year, the official reported upon should submit a brief resume, not exceeding three hundred words, of the work done by him, bringing out any special achievement of his. The resume should be submitted to the reporting officer and should form a part of the confidential record. In giving his own assessment, the reporting officer should duly take note of the resume and after making his own comments and assessment, submit the entire record to the next higher officer, namely, the reviewing officer. The reviewing officer should add his own comments, if any, and also do the grading.

(2) The gradings in the confidential report should be reduced to three : (*i*) fit for promotion out of turn; (*ii*) fit for promotion; and (*iii*) not yet fit for promotion. There need be no such category as 'unfit for promotion'.

(3) Only five to ten per cent of officials engaged in work of a similar nature and at the same level in any office or organisation should normally be graded 'fit for promotion out of turn'. This grading should be supported by a specific mention of the outstanding work.

(4) There is no need to communicate adverse remarks to an official. In the event of any adverse remarks having been recorded, the reviewing officer should after discussing them with the reporting officer, and, if necessary, the officer reported upon, either confirm the remarks or suitably modify them, as the case may be.

[Shri H. V. Kamath, however, does not agree with this proposal and feels that the present practice of communicating adverse remarks to the employee should continue.]

(5) The annual report may be called "Performance Report" instead of "Confidential Report".

42. [To provide incentive for those who are comparatively junior and yet very competent and make the best use of them as quickly as possible] half of the vacancies available for promotion of Class II officers to Class I, including all-India Services, may be filled by the existing method and the other half on the basis of an examination. [This examination should test the candidates' knowledge in the subjects

dealt with in his department as well as his general intellectual capacity]. Class II officers may be allowed to sit for this examination, provided that they have put in a prescribed minimum number of years of service, say, five, and have not been graded as 'not yet fit for promotion'.

43. In respect of promotion from Class III to Class II in cases where no examinations are now held and the area of selection is large enough, an examination of the type recommended by us for promotion to Class I from Class II may be introduced for the purpose of filling 50 per cent of the vacancies, the other 50 per cent being filled by the existing method.

44. (1) In the functional areas, promotions from one grade to another in the Junior and Middle levels, in the all-India and the Central Class I Services, should be made by a formally constituted Departmental Promotion Committee presided over by the Chairman or a Member of the Union Public Service Commission.

(2) Selections to the posts of Deputy Secretaries in areas outside any particular functional area should be on the basis of the mid-career selection process given in Chapter III.

(3) Promotion from middle levels to the senior levels, that is, the senior management in the functional area as well as outside the functional area, should be by a committee consisting of the Cabinet Secretary, the Secretary of the Department of Personnel and one of the senior Secretaries.

CHAPTER IX : CONDUCT AND DISCIPLINE

45. Rules relating to the recruitment and other conditions of service of Government employees, serving the Union may continue to be made by the President in the exercise of his power derived from the Constitution. The rules should, however, be placed before Parliament. Similar procedure should be adopted in the States also. [Shri Kamath, however, considers it desirable.]

46. [A Government servant holds a special position in society in that he is a part of the machinery—the Administration—on whose uninterrupted and efficient functioning depends the well-being of society, nay, its very survival. In whatever situation he may be functioning, his work and conduct have a direct effect on the people.]

(1) Every Government servant should before entering upon service sign a pledge that he will under no circumstances resort to strikes.

(2) [A strike in a Government department being a serious matter, it is also necessary to make it punishable under law.] The Essential Services Maintenance Act, 1968, authorising the Central Government to prohibit strikes in essential services and providing for penalties for persons participating in prohibited

strikes or instigation and financing such strikes should be adopted also by the State Governments.

[Shri Kamath, however, is opposed to the proposed blanket ban on agitations and strikes by Government employees. He explains, "such a ban would be justified only if we devise, as a pre-condition, an expeditious and efficient machinery for the timely redress of legitimate grievances and genuine hardships arising from conditions of work and living." The ARC's plea that "the employee should regard himself and conduct himself as a model citizen, and therefore not resort to strike "could rightly be insisted upon only if the Government, which is not merely the largest but also the most important employer in the country, undertakes to behave as a model employer. Shri Kamath is also against the ARC recommendation of a non-strike pledge by a government employee on his joining the civil service.]

47. [While strikes should be prohibited in Government departments, it is necessary that there should be a machinery for redressing the legitimate grievances of Government employees. The proposed legislation to place the existing Joint Consultative Machinery on a statutory basis should be welcomed. Joint Consultative Machinery should be set up for settling the grievances of Government employees in the States also and be given a statutory basis.]

    (1) The employees' representatives in the Joint Consultative Bodies at the lowest levels—regional or departmental as the case may be —should be directly elected by the employees. For the bodies at the higher level or levels, the representatives should be chosen through indirect election.

    (2) No person who is not serving under Government should be eligible for election to the Joint Consultative Bodies.

48. Legislation may be passed declaring demonstrations inside public offices, leading to disruption of orderly and peaceful work, as an offence for which punishment can be imposed as on acts of public nuisance.

49. Where the volume of work in connection with the departmental enquiries justifies the appointment of a separate officer for a department, or a group of offices, or for a region, a separate, wholetime officer fully trained for conducting disciplinary proceedings may be appointed.

50. Powers to compel attendance of witnesses or production of documents or to examine the witnesses on oath, etc., should be vested in the officers holding disciplinary inquiries.

51. The item "withholding of promotions" may be deleted from the list of penalties which can be imposed in departmental disciplinary proceedings.

52. No person should ordinarily be kept under suspension for a period of more than three months except in the cases pending in the courts.

53. (1) Provision should be made in the rules for summary disposal of disciplinary cases in respect of misdemeanour or other irregular acts arising from insubordination, contempt, and unbecoming conduct including intimidation or threat of violence.

    (2) All supervisory officers should be empowered to suspend a subordinate officer in circumstances disclosing gross dereliction of duty, subject, however, to a review of the order of suspension, within a short time, by the next higher authority.

54. (1) Civil Service Tribunals should be set up to function as final appellate authorities in respect of orders inflicting major punishments of dismissal, removal from service and reduction in rank.

[Shri Kamath considers that the proposed Administrative Tribunals ıould also be empowered to hear appeals in respect of other matters such as ıpersession, seniority lists, etc.]

    (2) There should be one Tribunal at the Centre with jurisdiction over the all-India Service officers, all the Central Government employees at Delhi as well as all Central Class I employees serving outside Delhi. There should be one Tribunal for each State or for a group of States to hear appeals from State Government employees as well as Central Government employees other than those in Class I stationed in the geographical area within the jurisdiction of the Tribunal.

    (3) Each Tribunal should be presided over by a person who is or has been a Judge of a High Court, or is qualified to be such a Judge. The Tribunal should include an eminent member of the public having experience of administration, and a senior officer of Government.

    (4) The Chairman and Members of the Tribunal at the Centre and in the States will be appointed in consultation with the Chief Justice of India, or the Chief Justice of the High Court concerned.

    (5) The person aggrieved by an order inflicting a major punishment will have the right of first appeal to a departmental authority except in a case where the order of punishment is passed by the President or the Governor. The Tribunals will hear appeals against the first appellate orders as well as the punishment order passed by the President or the Governor, as the case may be. When the Tribunals are established, the Public Service Commission need not be consulted before an order inflicting a major punishment is passed by the President or the Governor.

55. The suggestions made in the report of the Study Team on the Machinery of Government of India and its Procedures of Work, Part II in paragraphs 9.4 to 9.9 relating to the enforcement of punctuality, the maintenance of the official premises, etc., may be considered and implemented by Government.

CHAPTER X : CONDITIONS OF SERVICE AND RELATED MATTERS

56. Administrative offices should observe working hours from 10 A.M. to 5.30 P.M. with a lunch break of 45 minutes on all working days and with every Saturday being half-working day from 9 A.M. to 1 P.M. Sundays should be holidays as at present. Other offices should follow this general pattern with such alterations as may be required by local needs.

57. (1) There need not be a holiday on Independence Day.

(2) The system of restricted religious holidays may be dispensed with by adding two more days to the present 12 days casual leave quantum.

[Shri Kamath, however, disagrees that the holiday on Independence Day should be abolished.]

58. (1) For overtime working, the time spent beyond the prescribed hours may be totalled up and for each six hours of overtime working, an off-day may be given. Suitable increase in staff, wherever justified for this purpose, may be provided.

(2) Where the course suggested above is not feasible, cash compensation may be paid at hourly rates, as at present, but such compensation should, in a week, be limited to an amount not exceeding one-twelfth of the monthly salary. Such payments should be resorted to only in exceptional cases.

59. (1) A civil servant may be allowed to retire voluntarily after he has completed fifteen years of service and given proportionate pension and gratuity.

(2) Such government servants who may have been superseded may, however, be allowed to retire even earlier on similar terms if they have put in at least ten years' service.

60. In cases, where civil servants are retired for reasons of their unsuitability or inefficiency, etc., at the age of 50 or after the completion of 25 years, the list of such persons should be drawn up by a high-powered committee. For Class I civil servants, the committee may consist of the Cabinet Secretary, the concerned Secretary and the Secretary of Department Personnel at the Centre, and the Chief Secretary, the Head of the Department and the concerned Secretary, in the States. Similar committees should also be formed for Class II civil servants.

61. If a temporary employee has continued in Government service, without a break, for ten years or more, all such service, whether followed by confirmation or not, should count for pension and gratuity on the same scale as admissible to permanent Government employees.

62. [A steady erosion in the purchasing power of money coupled with the incidence of taxation has made the present scale of pension far

too inadequate. As an item of welfare and in order to sustain the morale of the service, the pensionary benefits should be liberalised.]

(1) The quantum of pension admissible may be raised to 3/6ths of the average emoluments of the last three years of service, as against the existing 3/8ths. The present ceiling should also be raised to Rs. 1,000 per mensem. The receipt of a death-cum-retirement gratuity should be made optional, and any reduction in the quantum of pension on this account should be made only after the expiry of the first two years of retirement.

(2) The restrictions which now operate on the acceptance of commercial and other employment by retired personnel during a period of two years after retirement may be removed or approval of such appointments given as a matter of course. This should, however, be subject to the condition that if the salary received in the new employment, together with the pension, exceeds the last pay drawn, the pension will be withheld in part or *in toto*, as may be necessary.

63. The existing medical reimbursement scheme should be abolished. In order to more effectively serve the government servants, the Contributory Health Scheme should be extended to all government servants. Meanwhile, suitable monetary ceiling should be fixed for reimbursement of medical expenses.

64. (1) Incentives for timely completion of a specific project may be provided through suitable awards such as rolling cup or a shield. In individual cases, commendatory certificates may be issued.

(2) Cash awards or one or two advance increments may be given to those who give valuable suggestions for simplification of work which lead to economies in expenditure or otherwise increase efficiency.

(3) Any exemplary or special achievement by an employee may be recognised by grant of medals as is practised at present in the Police Department.

65. Government should accept, in principle, the need to provide reasonably good accommodation to all its employees. As an immediate measure, Housing Boards should be encouraged to build houses and rent them out to Government servants. Necessary financial assistance may be provided by Government or arranged through the Life Insurance Corporation, for the Housing Boards, for this purpose.

66. In view of the mounting unemployment in the country and of the pressing need to ensure that at least each family should have some means of subsistence, it would be reasonable to impose restrictions on the employment of more than one member of a family, at least under Government. For this purpose, the family should be taken to mean only the husband and wife. Both the husband and wife should not be employed under Government at the same time.

[Two ARC Members (Shri V. Shankar and Shri T. N. Singh) totally disagree with the above recommendation and another one Member (Shri Kamath), while agreeing in principle, has proposed that the restriction on the employment of the wife simultaneously with the husband under Government may be relaxed, in the case of jobs, for which women are, by nature, perhaps better fitted than men, particularly teaching, nursing, some kinds of office work and certain jobs where a degree of patience and precision is called for. Shri Shankar holds that the proposed restrictions would be discriminatory, not in the public interest and of doubtful institutional validity. Shri Singh thinks that such a restriction is not going to make the least bit of dent on the nature of the unemployment problems, and "smacks of medievalism."]

67. [Though O & M work in the Government of India started about 15 years ago, it has not yet been put on a proper footing and has not been given the importance that it deserved.]

(1) Work norms for various posts in Government, specially at Class III and Class IV levels, should be evolved urgently. A target date for completing this work should be fixed for each Department and the resources of all units concerned with this aspect, namely, the O & M units, the Staff Inspection Unit and the Department of Administrative Reforms, should be pressed into service.

[Shri Kamath makes the added recommendation that the Administrative Reforms Department and the Staff Inspection Unit should be amalgamated and that the State Governments should also set up a unified organisation for administrative reforms and the improvement of administrative efficiency.]

(2) Staff strength of all organisations should be reviewed by the Staff Inspection Unit. There should be no exemption whatsoever, given to any Ministry or organisation in this matter.

(3) With a view to spotlighting delays, nothing on papers which are not disposed of within a prescribed time after receipt thereof, should be made in red ink.

(4) A complaint book should, as a rule, be kept in all offices which have dealings with the public. The head of the office should himself scrutinise this book from time to time and satisfy himself that action is being taken or has been taken to redress the grievances.

(5) The work of revising office manuals, Civil Service Regulations, Fundamental Rules, etc., should be taken up by the O & M organisation. A competent body of persons from the concerned administrative office aided by experienced officers from the Audit Department should be entrusted with this task.

[The civil service as a whole, should have a motto, indicating the spirit which the civil servants should have as a whole. This motto should be धर्मो राक्षति रक्षितः (Dharmo rakshati rakshitah) which effectively brings out the idea that Dharma will protect those who themselves diligently uphold it.]

[Shri Kamath has made an additional recommendation that (*a*) for purpose of service benefits including seniority, eligibility for promotion, etc., there should be no distinction between persons appointed to posts likely to continue indefinitely and those appointed to permanent posts; (*b*) except where an organisation or a post has been created for performing a purely *ad hoc* function, all posts which continue for more than two years, should be treated as permanent.]

BOOK REVIEWS

POLITICS AND GOVERNMENT AT HOME AND ABROA
By W. A. ROBSON, London, Allen & Unwin, 1967, 37 sh. 6d.

Those who are familiar with the many essays and articles of Professor Robson which have been appearing during the last ten to fifteen years in periodicals like the 'Political Quarterly', 'Public Administration' and otheis, (as a side-effort to the publication of his substantial volumes on different aspects of public administration), will welcome their collection in one volume on account of their permanent value. A couple of lectures delivered by him during these years are also here. And the book will be useful particularly for others who may not have read or heard some of these pieces at the time. Professor Robson's books have been mainly concerned with British public administration, though in an amazing variety of its aspects ever since his first works on 'The Relation of Wealth to Welfare' and 'Justice and Administrative law' appeared now more than forty years ago, and going on to works on the Civil Service, Local Governments, Public Enterprises, Social Security, Metropolitan Government and Teaching and Research in Public Administration. But in these essays are contained also his impressions of India, the USA and Russia and even Africa, countries and continents which he has been visiting and re-visiting more recently, freed from his professional duties in the London School of Economics and free therefore to accept invitations from many lands. Without going into the details contained in many of Professor Robson's books on particular subjects, this volume illustrates the wide diversity of his studies, experience and observations in a valuable way.

In this book, apart from the tr velogue essays on India, Ameri and Russia, some deal with speci subjects like public enquiries as instrument of government, the pr blems of metropolitan governme the reform of British government a the present state of teaching and r search in public administratio Others of a more fundamental i port, in a way, discuss the relatio of freedom, equality and socialis the meaning of education for dem cracy, and the problems arising o of the transplantation of politic ideas and institutions. The wi variety of subjects covered helps emphasise the author's deep conce with the basic requirements of d mocratic politics and government well as with the relations of t social and political order,—whi concern may not always have be apparent in the author's earlier wor taken separately.

But perhaps, the most interesti and important essay in the volun is one recently published in Pa on "The Future of Public Admini tration", in a series dealing wi emerging trends in different aspec of contemporary society. Here Pr fessor Robson points out, amo other things, how the West is movi into an era in which the superficiali and emptiness of some of the mo widely-accepted and eagerly-soug elements in the conception of affl ence are becoming increasing obvious,—such elements as avera income per head, the number motor cars, washing machines, r frigerators and telephones p thousand of the population, and su

status symbols of natural achievement as jet airlines, steel mills, hydro-electric dams and nuclear weapons. For along with these are seen also rising figures of crime, drug addiction, divorce, venereal disease, illegitimacy and suicide; the preoccupation of films, plays, television shows and novels with murder, cruelty, horror and suspense, and the phenomenon of gangs of alienated juveniles who reject the mores of their society and the authority of parents, teachers and government. As against these he points out that three elements of life are being increasingly realised as of the importance to civilisation; these are satisfaction or pleasure from work, the creative use of leisure and the importance aesthetic pleasure plays in the lives of people. All these have their bearings or trends in public administration and for non-western countries as well. This and much else in the essay makes it perhaps the most valuable piece in the book, and it brings out a certain sensitivity and imaginativeness in his outlook on problems of government which every one may not have always suspected in Professor Robson.

One of the essays is a review-article on a recent two-volume work of undoubted importance published in the United States on public administration theory. Without quite implying that it indicates a certain insularity in Professor Robson's outlook, the essay undoubtedly shows his concern has always been more with public administration practice in a diversity of contexts rather than with its historical or theoretical aspects, especially when such treatment shows a certain tendency towards the manipulation of concepts. Mention must also be made of an amusing essay which describes the part which Bernard Shaw played in helping the author to found 'The Political Quarterly'; the essay is enlivened by some very characteristic letters from Shaw.

—V. K. N. MENON

HISTORY OF INDIAN ADMINISTRATION, VOL. 1: ANCIENT PERIOD, By B. N. PURI, Bombay, Bhartiya Vidya Bhawan, 1968, Rs. 20.00.

In this first volume of the *History of Indian Administration*, Professor B. N. Puri covers what is popularly known as the Hindu period—from Vedic and pre-Vedic times down to about the tenth century A.D. and brings together between two covers, most of the available information on this long period. In such a book of administrative history, we expect two things namely, (*i*) a clear empirical account of the structures and processes of administration in their proper socio-political context, with a due sense of proportion and emphasis, and (*ii*) a balanced interpretation and evaluation of these structures and processes by comparison with other ancient societies and in relation to the evolution of bureaucratic institutions in world history. In my view, Prof. Puri has carried out the first task conscientiously and with much competence but has not even seriously attempted the more important, second task. That about sums up the strength and weakness of the book.

The author has, as a good historian, tried to avoid dependence on any single source and has drawn his material from at least three different sources, such as inscriptions, coins and works literary, religious and political. Thus his account of Mauryan administration is not based on Kautilya's *Arthasastra* alone but uses

epigraphic evidence to confirm and modify the rather tidy picture of *Arthasastra*. Nor does he shirk admitting the inconclusive or conflicting nature of the evidence in regard to several practices and positions. For example, he discusses the ambiguity of terms, such as Kumaramatya, or Dandanayaka. This honesty characterizes his references to geographical administrative divisions, such as Vishya, Bhukti, or Nadu, for he clearly admits the uncertainty of their extent and their borders. In all these regards, the book is a work of honest and reliable scholarship.

It marks an advance in another important respect also. Earlier works on Hindu polity and administration fall broadly into two divisions. There are comprehensive accounts of Hindu political-administrative institutions, such as Altekar's *State and Government in Ancient India* or Dikshitar's *Hindu Administrative Institutions*, which look at the total conspectus of Hindu achievement somewhat unhistorically. The average reader can find in them only casual references to the *evolution* or *decay* of institution as centuries passed. At the other end, truly *historical* accounts of polity and administration, such as those of Mahalingam or Minakshi (or even of Altekar or Dikshitar) are confined to a single empire or dynasty. Prof. Puri is more or less the first to look, in the manner of a true historian, at the long Hindu period and describe the rise and fall of some institutions and the evolution and modification of others. His chapters are organized chronologically, from the Vedic period—through the Mauryan, Guptan and Harshan periods on to cover the Rashtrakutas, Pandyas and early Cholas, and the evolution of administrative institutions is traced mainly in regard to central, provincial, village and city government. From the informal arrangements of the Vedic period, we ar taken through the complex bu controlled Mauryan bureaucracy its modifications under the Gupta and the local variations and late accretions. Practically all the available detail from the various source is covered—and a short last chapte deals with the export of Hindu administrative institutions to greater India.

The author's method of presentation has two shortcomings. In the first place, a lot of the material about the evolution of various institutions could have been conveniently presented in chart form —and this is done with great advantage in such heavyreading classics of comparative administration as Eisenstadt's *The Political Systems of Empires*. In similar manner, the evolution of regional government in India, from the Satrap system and the Princely viceroyalties—and its later penetration down to the smaller units (districts) and down even to the level of the village (self-governed or otherwise) could have been more interestingly presented in a chart. There are other developments too which could have been so presented. As such, all evolutionary tendencies are buried in different chapters, and referred to almost in passing at the end of each chapter.

The second shortcoming in presentation is the rather "cataloguing" style of the author. This perhaps is not so easy to avoid in this type of work through relegating more of the routine information to the footnotes—as the latter seem to be already longer than the text itself. (In fact, they occupy about 40 per cent of the total space and if printed in the same type as the text, they may be longer than the text.) But these shortcomings notwithstanding, the author has done a good job of description with a due sense of proportion and emphasis.

The real weakness of the work is that the author does not even attempt the other job of interpretation and evaluation of the whole story—except casually. Thus a claim, albeit cautious, is made about the 'continuity' of the Hindu administrative tradition. But of the serious questions that would concern a modern student of administration the author makes no mention whatever.

Let us analyse this term continuity itself. It is pointless to mention it without discussing at what level it obtained. Any population which has inhabited a country for centuries can claim a low level of continuity—*i.e.* at the genetic level. Similarly, any civilization, which had risen from the tribal or nomadic level to organize sizable Kingdoms, is bound to retain some practices. As the King cannot be everywhere, he would divide the country into suitable areas and keep a deputy in each area. This regional division of Kingdoms is bound to continue with area-adjustments even with the change of dynasties. To claim this type of continuity is simply to say that organized life had not relapsed into barbarism—or tribalism as it did in some parts of Africa.

Thus, any claim of continuity needs to be carefully explained in terms of what has continued, or has evolved naturally into something more sophisticated. It is clear from author's account that: (*a*) there is practically no statistical evidence about the caste or other social antecedents of office holders—all the epigraphical evidence being concerned with some cases only; (*b*) there is little cartographic evidence about the extent and limits of provincial or district divisions; (*c*) the terms used for several offices are imprecise or ambiguous; and (*d*) more often than not, the epigraphic evidence is purely incidental. In other words, most of the inscriptions deal with gifts—and the mention of official designations and deeds is rather ornamental. In contrast to this, the evidence concerning Chinese Imperial administration is quite quantitative, more precise—and straight to the point—as, much of it is derived from the plethora of official biographies—dealing mainly with official doings. Indeed, the evidence presented by Prof. Puri can sustain only a claim for a general patchy continuity—without much precise detail.

Looked at objectively, this need not worry us. We may look for more evidence from known as well as new sources, to press or modify one's claim for continuity—but it is rather unlikely that we discover any startlingly new evidence. On the other hand, we may evaluate more carefully the known material. Thus two important aspects of bureaucratic specialization had been discovered and used in India fairly early, namely separating financial from other work and deliberative from executive work. Regional divisions, though of unknown extent, had come to stay with their own administrative apparatus and sophisticated village self-government was being developed in the south in perfect harmony with central administration. These achievements are worth talking about, regardless of the imprecise nature of their continuity.

We need also face the question whether any high level continuity was desired at all by the leading minds of Hindu Society. Very probably not. One suspects that after the decline of the Gupta empire, somehow emphasis was very slowly shifted to socio-cultural continuity as a result of which no great effort was devoted to developing administrative coutinuity to a higher level of sophistication.

The whole picture of continuity was again created more by the writers of politico-administrative manuals from Kautilya to Kamandaka down to Sukra. Their work followed a similar pattern and was even repetitive for centuries. If scholars had completely ignored this literature and had gone by epigraphical evidence alone, no tall claims for sophisticated continuity might have been made in the first place. One suspects that there was always a wide gap between the manuals and actual practice. This need not detract from the Hindu achievement in academically discussing administrative organization. No other civilization has shown this passion for such academic analysis in this field, for, the Chinese scholar-officials wrote mostly about their actual doings without much theorizing, the Greeks wrote of forms of government, and the Romans about law. Indeed, Kautilya's analyses of inter-state relations or of general imperial organization have not been matched for centuries for their penetration and cold logic. But all this needs to be stressed quite apart from actual administrative practice.

There are other questions which a modern sociologist of bureaucracy would like to discuss. Bureaucratic evolution according to investigators, such as Udy, starts with hierarchical ordering and then goes on to division of work and onto rules, regulations and records. The evidence concerning the Hindu period is at present too piecemeal to support or modify this finding. Secondly, how much was the evolution of Hindu bureaucracy dependent on the regulation of water supply of some other common supplies as Wittfogel and Etienne Balazs feel it did, for other bureaucracies. The evidence on this score is too thin and almost confined to the single Sudarsana lake inscription in North India. Thirdly, Hindu bureaucracy was strictly a proto-bureaucracy based more on regional administration and hierarchy than on division of work. How did it survive in a patchy way, without attempting the Chinese type of continuity, when other such bureaucracies perished. These sociological questions need careful study.

Prof. Puri has not even posed any of the foregoing questions and one is tempted to ask why. Any interpretative analysis asking such questions depends heavily on: (*a*) careful comparisons or at least side glances at other similar civilizations and (*b*) a modern up-to-date knowledge of the subject, the history of which is being studied. Both these conditions are not fulfilled and much of the fault lies in the very nature of Indian academic life. Indian historians have in general neglected the art of comparison and evaluation. This may not do much harm in the case of some development peculiar to India, but in regard to administration, which was developed in at least sixteen other bureaucratic empires (according to Eisenstadt) a non-comparative account is a study in a vacuum and basic questions which easily suggest themselves even with elementary comparisons are ignored in such a study.

Up-to-date knowledge of the subject of historical study is now considered as a basic necessity in Economics and is beginning to be considered so in regard to administration. It is more or less agreed upon that economic history ought to be written by an economist rather than a historian. Things are developing the same way in regard to administration too; thus the recent classical administrative histories have been all written by teachers of administration —such as White and Van Riper in U.S.A., or Aylmer or Parris in

Britain. The last great historian to write a detailed Tudor administrative history, namely Taut, was saved from doing a messy job, mainly because, I guess, he lived in a University atmosphere where a deep acquaintance with sister disciplines was both essential and easily cultivable. It is understandably difficult to pose interesting questions for interpretation, if the books consulted on administration stop with the works of the good old trio of Wilson, White and Willoughby. It is unfortunate that a historian of Puri's scholarship and industry should have been exposed to this isolationist ethos of the Indian academic jungle and have produced thereby a work, excellent in description and poor in interpretation. Let us, however, be thankful for what it is.

V. SUBRAMANIAM

THE DEMONICS OF BUREAUCRACY: PROBLEMS OF CHANGE IN A GOVERNMENT AGENCY; By HARRY COHEN, Ames, The Iowa State University Press, 1965, pp. 276.

The book is based on Harry Cohen's experiences as an employment interviewer in a government employment agency for three years. This participation enabled him to get a close look at the workings and the pathologies of bureaucracy. Cohen was later associated with professor Peter Blau, whose sociological analyses of the bureaucratic phenomenon have won international recognition. *Demonics of Bureaucracy* is a product of the happy blending of author's two experiences. What the author calls "the comedy of errors of my life" which led him through "a series of totally unpredictable events", has resulted in a perceptive book—a very welcome addition to the growing volume of literature on the sociology of bureaucracy.

The intriguing title of the book plays on Blau's now famous *The Dynamics of Bureaucracy*: it studies the dynamics of bureaucracy in a pathological direction. Many of the concepts and the anaytical framework used by Cohen are derived from Blau, but much of his analysis and discussion is refreshingly original and stimulating.

The introductory part of the book discusses the theories of bureaucracy. This is followed by an extended treatment of types of modification of procedures and of some effects of statistical recording procedures. Treatment of discrimination as an aspect of dysfunction precedes the author's concluding comments. There are two useful appendices.

Max Weber's well-known ideal type characterization of bureaucracy —it being based on rationalization and routinization of tasks, its emphasis on rules, its impersonality, its efficiency—is discussed against the background of actual experience and Cohen has shown once again how through informal interaction informal organizations grow within formal organizations. These result in informal changes that are not simply idiosyncratic deviations but form consistent patterns. Some of these patterns and their dysfunctions are discussed by the author with considerable insight.

Discussing the implications of his study Cohen makes a number of proposals. First, changing conditions *require* changing procedures and not inflexibility. Second, having to operate in a setting in which it has to be sensitive to local conditions strict conformity to rules, procedures, and precedent by the

bureaucracy is not to be desired. Third, it should be organized to encourage flexibility and dynamism, but focus this toward the major organizational goals, achieve loyalty to the goals of the organization, and at the same time achieve autonomy and altruism on the part of all participants in order to avoid strains for dysfunctional modifications; and checks and balances of internal and external sources against misuse of bureaucratic power and deviation from goals should be maintained.

—S. C. DUBE

THE SOCIAL PSYCHOLOGY OF ORGANIZATIONS, By DANIEL KATZ and ROBERT FESTINGER, New York, John Wiley & Sons, Inc, pp. 498, $ 8·50.

Neither Katz nor Kahn are strangers to the field of social psychology and organizational behaviour. Their earlier works in the area have been of such importance that the present work hardly requires a recommendation. The main feature of this book is its extension of the open-system theory, as opposed to the closed system where primary attention is given to the internal structures of organization. The open-system theory emphasizes the close relationship between a structure and its supporting environment by casting organizations in terms of roles, and thereby subsuming under it a variety of traditional and often unrelated discussions of leadership, policy making and organizational change.

The fourteen-chaptered book starts from a point where a typical book on social psychology leaves off —a treatment of face-to-face groups. Thus, the present book is more in the nature of a supplement to the usual social psychology text and begins with the behaviour of people in the organizations. The second chapter deals with the concept of organization and systems—as to what behaviour belongs to them and what lies outside. The next two chapters discuss nature and characteristics of social organizations and their development, discussing, *en passant*, three classical models of organization. Herein also the stages of organizational development and emergence of dynamic tendencies among subsystems are considered. Chapters five and six respectively deal with the organizational typologies and the criteria of organizational success. A typology is proposed, based upon genotypical functions of the organization (its role as a part of the larger society and the more specific second order features). It is in these early chapters that the above referred open-system theory is explained. The concept of role is proposed as a major means for linking the individual and the organizational concepts of research and theory. Several complications are examined in connection with the treatment of organizational role. The chapter concludes with a review of the empirical evidence bearing on the model thus proposed.

The later part of the book is devoted to the analysis of processes and problems of organization in terms of the open-system theory. A chapter each is devoted to power and authority, communication and flow of information, policy formulation and decision-making, leadership, the psychological basis of organizational effectiveness, and the organizational change. A twenty-one-page chapter summarizes the book.

The book is written in a lucid style and in rather simple language. The research findings and specific

examples from industry and government are generously given. An extended bibliography would have been a great help to anyone wanting to plunge deeper. All considered, the book should be a welcome addition to the work-desk of the students, teachers and the research workers in the field. Appropriately, the book is dedicated to Floyd Henry Allport.

A major shortcoming is that, like most American authors, the present authors have also chosen to largely ignore work done outside the United States. This is more unfortunate since any laws and theories regarding organizational functioning should be able to cover adequately organizations functioning at different levels of sophistication in different cultural settings. The authors, for example, have not made any attempt to illustrate their models from examples of work done on organizational structure and functions in India, on which several reputed publications exist. To this extent, therefore, the book lacks something for the Indian reader.

—H. C. GANGULI

THE SYSTEM : THE MISGOVERNMENT OF MODERN BRITAIN; By MAX NICHOLSON, London, Hodder and Stoughton, 1967, pp. 525, *50* sh.

For some time past the "System" of British Government has come to be severely criticized by all those who felt "bewildered and depressed" at the repeated frustrations and setbacks that England has suffered in the last three decades. Much of these failures have been attributed to the stubborn resistance of a tradition-ridden governmental system to adapt itself to the rapidly changing social, economic and political processes in the country. The gradual loss of an empire, the dwindling role of Britain in world affairs, the agronomy of the Suez adventure, the abortive bid for entry to the Common Market, the Rhodesian rebuff, coupled with the deep economic crisis and the social malaise at home have all led the serious minded people to think as to "what went wrong with the system of government" and how "Britain got bent". This is the task which Max Nicholson has set for himself to discover in his book under review, entitled: *The System*, and rightly sub-titled as *The Misgovernment of Modern Britain.*

Starting on the assumption that the true diagnosis of Britain's troubles and its practical correction requires a deeper and broader study, the author has tried to analyse the governmental system as a whole and has not limited his enquiry only to one particular aspect or level of the governmental machinery. After surveying briefly the earlier and recent British history to find out how the governmental system has evolved, and the environmental and social factors which have shaped and moulded the existing governmental institutions, the author outlines, what he considers the seven areas of misgovernment, *viz.*, "the elector—as a sharer of sovereignty, but without the opportunity for continuous participation in the guidance of his destinies; the citizen—as one of the governed without effective protection against the executive; the Parliament —so long being adamant, when ought to have been adaptable; the civil service—the archaic and non-professional constituted on mistaken lines to fulfil a role which has long since ceased to exist; the general layout and organization of government—still revolving round the officers dating from the eighteenth century or earlier; the now admittedly impossible

mess in local and regional governments, and finally, the entire failure of the government to find facts and to analyse problems rightly and correctly." Proceeding further the author discusses Britain's performance in various fields during the years 1926-66, and singles out various turning points in the British record of forty years of immediate past. His conclusion that "only over a minor part of the field the governmental measures were successful and in almost every case where this occurred it was due to some exceptional or lucky initiative evading or overcoming the built-in tendency of the system to come up with the wrong answer or with no answer at all "(p. 335), seems not only a bit exaggerated but may also be shocking to many of those who do believe that the system needs to be wholly reorganized and reformed. There has never been any occasion in the recent past when the system showed any signs of diffusion even in times of its greatest strains.

The remedial measures proposed by the author include the drastic redistribution and decentralization both of power and of powers in the United Kingdom; creation of distinct territorial administrations and representative bodies for England, Wales, and Scotland, as well as Northern Ireland; a drastic reduction in the size of the Cabinet and the series of Departments, staffed by professional public administrators drawn from various quarters. All these seem to be quite realistic and one might agree with them at least on principles. Nevertheless, one wonders, whether the extent of revisions contemplated by the author in the present system of government are not too drastic and radical steps to be readily accepted even by the most liberal society. For example, his proposal to totally abolish the Treasury has to be taken with a pinch of salt for even the Fulton Committee proposals which seek to deprive it of its control over personnel do not aim to divest it with its primary power of financial control. In a democratic society, the process of reforms, in order to be acceptable and successful, has always to be gradual and palatable one. Surprisingly, however, in Max Nicholson's analysis one does not find any mention of the pattern of the reform for the House of Lords, which, for the past few years, has attracted a considerable criticism both inside and outside the Parliament, and which definitely needs some basic revision at this juncture.

The book very aptly conveys the deep conviction of the author that something is definitely wrong in the "system", which has been responsible for the present state of complacency of the English people. His sharp and pungent criticism and his suggested drastic remedies spring from his passionate concern for the future of Britain and because of this he is not afraid "to pander the feelings of those responsible for the present state of affairs". At the same time the author is not a pessimist, for he sincerely believes that "Britain (still) remains full of promise, with flashes of brilliant fulfilment and longer stretches of tedious eclipse". One might not be completely in agreement with the author's diagnosis and his prescription that the "(British) people have relapsed into a muddle about who they are, what they want to do, and how it might be done. The mainspring of this muddle (if a muddle can have a mainspring) is the warped relation between government and governed. Once this is corrected, even without any clear preconception about future purpose, the rest can follow." There is no doubt, however, that the author has quite succeeded in his attempt to show how Britain has been

systematically misgoverned and her resources mismanaged. Written in a forceful style, with occasional wit, and without the semblance of a documented dry academic work, (although a serious student of government might find the bibliographical note at the end to be quite useful), the book on the whole presents a very interesting and penetrating analysis of the current scene and malaise in the British Government and society. It certainly deserves to be read not only by the students of British government and administration, but by all those who believe in the efficacy of a shock-treatment for the correction of the governmental ills.

—R. B. JAIN

CRISIS IN THE CIVIL SERVICE, By HUGH THOMAS (Ed.), London, Anthony Blond Ltd., 1968, pp. 139.

This is a collection of four essays, three of them recent, but one at least ten years old and reprinted from an earlier collection, *The Establishment*. All the four essays focus attention on the mechanics and the centres of policy-making in the British Government. There is a common theme running through three of the essays—"The Apotheosis of the Dilettante", by Thomas Balogh, "The Making of Economic Policy", by Roger Opie, and "The Structure of Power", by Dudley Seers. The fourth, "Towards a Revision of the Official Secrets Acts", a contribution by the editor, Hugh Thomas, is on a different and specific issue but its conclusions nevertheless lend support to the general thesis of the first three.

What is this thesis? Britain has declined after World War II in prestige, in power, and as regards plain bank balance and for this the Civil Service should take the rap; national policies have been wrong and national affairs have been mismanaged; the political masters of the moment have been fooled, misled or rendered ineffective by the Civil Service; the Civil Service has become all-powerful but is not competent to discharge the responsibilities going with that power; the Civil Service is too protected, too obscurantist and being 'faceless', it escapes retribution for its sins; it is intolerant of outside interference—however well-intentioned—and contemptuous of the outside 'professionals', who should know better in such of their own fields as also concerned national policy. The authors suggest several remedies—open up the higher rungs of policy formulation to outside professionals; let the Ministers of the day bring with them the policy advisers of their choice; let public issues of crucial importance be debated publicly; let policy be framed on hard facts and cold reason instead of vague hunch and nostalgic disdain; break up the concentration of power presently located in the Permanent Civil Service Heads of the Treasury. In other words, change the structure and responsibilities and, therefore, the character of the Civil Service so as to make it more suited to the needs of an island kingdom that must heave to, in order to keep afloat rather than those of a night-watchman State with a sprawling empire that was and that never will be.

Thus, the Civil Service has been put on the mat. A word of explanation here. When the authors talk of the Civil Service, they do not refer to the whole of it nor even a substantial part thereof. The scrutiny is limited to a numerically miniscule part of it, namely, the administrative class. In the present book, while criticism generally falls on this class, the attack is concentrated on a group

within this class, which mans the higher echelons of the Treasury, and their counterparts of the Diplomatic Service dealing with economic matters. Again, when the authors talk of 'professionals', their preoccupation is with only one brand of these, *i.e.*, economists. This selectivity is understandable, since the ills that have plagued Britain in the recent past and that continue, are economic. In matters economic, as in many others, the Treasury in the U.K. occupies the centre of the stage. The Treasury knights, the mandarins, the boys in the "old boy network", terms by which the authors refer to the administrators in the Treasury, therefore, come in for round condemnation. Professional economists are made to appear as rejected Cinderellas.

The case against the existing system is built up with consummate skill and has been based on concrete instances in which the authors demonstrate conspicuous failures on the part of the economic policy-makers in the Treasury. Thomas (now Lord) Balogh makes certain telling points born out of personal experience inside Government. (He, like two of the other authors, Roger Opie, and Dudley Seers, served for a time in Whitehall.) It would appear that the top echelons in the Treasury have erred all along on major economic and concomitant political issues. They erred in their estimates of the extent of Nazi rearmament prior to World War II and the nation paid the price of being unprepared to face Hitler. Balogh's own estimate, as it now appears, came very much near the mark. It has been asserted that the draw on gold during World War II, the deleterious effects of which was happily counterbalanced by timely lend-lease and, the successive devaluation of sterling in the post-War years are the results of ignorance on the part of the Treasury policy-makers of the latest trends in world economics. Du Seers goes to the extent of saying the Treasury grossly miscalculate economic staying-power of Smith's Rhodesia and hints that political policies pursued appr his unilateral declaration of inde dence, were influenced by these w estimates. As all the world kn these policies have ended in fai Many similar instances are qu and the case is piled up, brick brick.

The authors are of the opi that things would have been gr different if outside professional nomists had been heeded and in utilised and, if the professi economists employed within economic section of the Trea had been given due weight ins of being sidetracked and their ad short-circuited. The authors c that the elected Ministers have little impact on actual policy. deed, the sytem prevents their pos contribution. Far from having decide on viable alternatives p by informed opinion, the Minist fed with the official point of superimposed on heaps of ill-infc ed memoranda with which, b busy and being a layman, he n must agree. "Whoever is in of the Whigs are in power". Ha Wilson is quoted with appro The provisions of the Official Sec Acts and the convention and fic that official policies are those of Minister and not of the offi themselves effectively prevent del on vital national issues. The ad nistrative class, drawn as it is pre minantly from university stud with a classics background, is equipped to appreciate the impl tions on the economic plane of national policies with which t deal.

The authors, therefore, press radical change in the entire struct

of policy-making and of the exercise of power. There should be greater provision for recruitment to the administrative class from among those trained in the social sciences. Professional economists presently in the Treasury should be integrated with the administrative class. Training in economics should be compulsory throughout the administrative class. This is not enough. The concentration of power in the permanent Heads of the Treasury should be disseminated. The Cabinet should be advised in the matter of all senior appointments by a committee of senior civil servants in place of the omnipotent Head of the Civil Service. Each Minister should be advised on all major questions of policy not by a single permanent head but by a committee of equal permanent officials. Ministers should have the freedom to import into their private offices outside experts relevant to the subject under their charge. In suggesting this the authors nearly approach the American system where Ministers bring their own policy-makers with them when they assume office.

One of the essays was specifically written to assist the Fulton Committee in its deliberations. The theme of the other three being the same, though not specially submitted to the Fulton Committee, they must have no doubt influenced the thinking of that Committee. *Crisis in the Civil Service* does not quite add up in its total effect, to the impression which the title appears to suggest of impending doom in the U.K. Civil Service. But it does succeed in crying wolf, allegorically speaking, and the cry has not been flippantly uttered (as happens in the fable) because, in the event, one can see a close rapport between the trends of thinking in the book and in the later report of Fulton.

The essays are all eminently readable and written with a facile skill which has become characteristic of much recent writing on questions of public administration of Britain. Specially, the one by Balogh abounds in wit which is often abrasive but never acerbic and with anecdotes which have the clear stamp of being related by a direct participant. However, one could question many of the generalisations contained in the book, *e.g.*, Balogh's observation—"Whenever any effort had to be organized, indeed palpably threatening disaster averted, outsiders had to be recruited to take charge." It is also open to question whether professional economic advice would have been or will be invariably correct, where the official viewpoint has been proved wrong. The latter viewpoint has elsewhere been stated eloquently by different authors, specially by C. H. Sisson, (vide *The Spirit of British Administration*) who holds that, in the ultimate, what is needed is to maintain the continuity of the realm and to interpret the mind of the Minister to Parliament and to distil it into public policy. Here is the rub. This is exactly what the present authors take up cudgels against. It is not mere continuity that is needed but positive action and well-informed decision. There is no such thing as the mind of the Minister in the existing context, because that mind is made up for him by the official helpers. In presenting their point of view, the authors perhaps exaggerate and, at times, pontificate with an evangelical zeal. But then, evangelists have necessarily to exaggerate and pontificate. It is an occupational hazard.

— A. V. Seshanna

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THE INDIAN JOURNAL
OF
PUBLIC ADMINISTRATION

Vol. XV April-June 1969 No. 2

TAMIL CONTRIBUTION TO HINDU POLITICAL THOUGHT

V. Subramaniam

MANY Western political scientists are now acquainted with the general outlines of Hindu political thought and are quite familiar with leading works on it, such as Kautilya's *Arthasastra*. They are, on the other hand, mostly ignorant of the famous South Indian classic, the *Kural* and its middle book on polity for several reasons.[1] This article attempts to make good this unfortunate omission, as the *Kural's* political concepts break new ground and deviate substantially from the mainstream of Hindu political thought. What follows is a brief analysis of these from the viewpoint of political science and comparative social history and looks into the relation between the social conditions of South India and the ruling political concepts therein. Before doing this, it is necessary to introduce the reader briefly to the author and his work.

The Author and His Work

Not much is known about Valluvar, the great author of the *Kural*. The slender evidence available suggests a date not earlier than the

[1] The main reason is perhaps that Orientalists in general were lost in admiration for the first book (on virtue) which rarely rubbed on to the middle book. From Father Beschi on to Pope, Drew and Lazarus, attention was focussed seriously on this first book. Albert Schweitzer too in his *Indian Thought and its Development* considers (pp. 200-5) essentially the ethical side of the *Kural*. A second reason is that the few political scientists who knew of the middle book treated it uncritically as a rehash of *Arthasastra*. Beni Prasad in his *Theory of Government in Ancient India*, states this explicitly. Other works such as Ghoshal's *History of Indian Political Ideas* (Calcutta) and K. V. Rangaswamy Iyengar's *Ancient Indian Polity* (Madras) imply this by omission. It is likely that all this influenced foreign savants.

second century before Christ and not later than the sixth century after. On the basis of internal evidence, one may infer that he was a Jain whose Jainism was strongly modified by a broad humanism.[2] Legends tell us of his profession as a weaver, of his impossibly virtuous wife Vasuki, his uncommercial friendship with a commerical magnate Elelasinghan and his resounding victory at the Great Tamil Academy in Madhurai. It is clear that these stories are fanciful but it is equally clear that his personality and work made such an impact on contemporaries as to invite such legends.

His famous work the *Kural* is unusual in world literature in many regards. It treats human life as a whole—as few works do—and reaches a high level of comprehensiveness.[3] Its three books deal respectively with virtue, polity and love and correspond to the three ancient Hindu *Purusharthas* or goals in life.[4] It is written in poetry—and the word 'Kural' itself means beautiful short couplet. This mode of writing reaches utter perfection in the author's hands with his merciless search for the *mot juste* and for clarity and brevity.[5] As a result, his phrases and idioms were avidly incorporated by later poets in their works.

The work itself has enjoyed fame and reverence as no non-religious work has ever done and succeeding generations of poets not only 'lifted' its beautiful phrases but paid direct tributes to its beauty, clarity and comprehensiveness. In course of time the best of these poems were strung together into a small anthology called *Valluvamalai.* Commentators of successive generations have also vied with each other in producing more and more elaborate commentaries. Western savants too, such as Pope, Drew, Lazarus and Albert Schweitzer, came under its spell and have sung its praises.[6]

As pointed out earlier, the work consists of three books on virtue, polity, and love respectively. The approach in all the three is humanistic and secular but we are currently concerned with the middle (and

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[2] I rely mainly on late Vyapuri Pillai's *History of Tamil Literature* for concluding that Valluvar was a Jain and I agree with him that the internal evidence for this is impressive. He was not alone in tempering Jain austerity. Other Jains originally averse to the romantic tradition of Tamil literature ultimately accepted it obliquely and used it too—as the authors of *Jeevaka Chintamani* and *Tinaimalai* did.

[3] Several Greek Authors deal with ethics and politics together but very few have added to this a sophisticated delineation of love.

[4] There are four Hindu *Purusharthas*, namely *Dharma* (Virtue), *Artha* (wealth), *Kama* (love), and *Moksha* (salvation), and as the last belongs to another world—Valluvar omits it.

[5] A couplet by an admirer *Idaikkadar* describes the *Kural* as—packing the seven seas (of knowledge) into a mustard seed.

[6] *See* footnote 1.

the longest) book on polity called *Porutpaal.* The work 'Porul' is the Tamil equivalent of the Sanskrit 'Artha' meaning wealth—but in practice it refers to a study of the polity that makes the accumulation of wealth possible.[7] This book has been neglected by Western political scientists, partly because their orientalist colleagues who were charmed by the resplendence of the first book on vitrue did not usually talk about the middle book. The Tamils themselves are partly responsible for the neglect as this book has often been treated in Tamil country as a treasure of worldly wisdom and a general guide to success, misinterpreted and quoted out of context.[8] One has, therefore, to approach the task of introducing and analysing the middle book with a fresh mind—even for a South Indian Tamil audience.

This paper approaches the task of analysis from the standpoint of the political scientist and social historian and attempts to investigate the following questions:

(*i*) *Porutpaal* is a manual of advice to the King. Such manuals were produced in plenty in North India, China, the Turkish and Persian Empires and even Europe—under broadly similar socio-political conditions. How far does *Porutpaal* resemble such other works and where does it differ from them?

(*ii*) *Porutpaal* (like the whole of the *Kural)* is a work in the broad Hindu tradition. Besides differences of detail (which exist even among Sanskrit works) where does it really strike out an original path away from this tradition?

(*iii*) From the viewpoint of the political philosopher how cogent and self-consistent a political theory does Valluvar build up in *Porutpaal* and for which ends? and

(*iv*) What influence, if any, did *Porutpaal* have on Tamil political history and Tamil political thought?

MONARCHS AND MANUALS

The term monarchy covers a rather wide variety of polities and includes the constitutional monarchy of Britain, the limited monarchies of medieval Europe, the absolutist monarchies of the post-Reformation period, the pint-sized monarchies of ancient Greece so well theorized

[7] *Arthasastra* does not deal as such with wealth—but polity which makes politics and economy possible. In regard to the *Kural* tool, a commentator makes it clear that *Porul* means society or polity that encompasses wealth.

[8] For a satirical account of this *see* T. P. Meenakshi Sundaranar, *Valluvar Kanda Nadum Kamamum,* Palaniappa Bros., Madras, 1957, Chapter 1.

upon by Greek philosophers and the monarchies in India, China, Persia or Turkey presiding over large areas. Manuals to advise the King were not much in vogue under every type of monarchy; for example in limited monarchies of the medieval or modern period they would serve little purpose in showing the King his proper place and they would be considered dangerous if they told him how to enlarge it. They would be somewhat superfluous in absolute monarchies should they tell the King how to *use* his nearly unlimited power and royal philosophers would be better employed in defending absolute or divine right against Bishops and Parliaments. They come in useful mainly where the prince's power in neither absolute nor precisely limited and where he can enlarge it against other groups, chieftains and natural obstacles. Such conditions obtained more or less in what Eisenstadt calls bureaucratic empires[9], but they also obtained—once in a way in other contexts too. Thus Bolingbroke could advice the future George III, in the atmosphere of a non-bureaucratic empire because he believed that the powers of the monarch and Parliament were sufficiently fluid for the former to attempt to enlarge them[10]. But broadly this condition of fluidity obtained mainly in bureaucratic empires—wherein the political system has, to some extent, separated itself from the wider social system but not fully—and the King had a natural urge to push forward, in search of "uncommitted" resources in men and material and of more power at the expense of other groups such as the nobility and gentry.

What was the purpose of these manuals under such conditions? Public advice to one party in the struggle for superiority is worse than useless—as it simply serves to arm its rivals with valuable strategic information. How then did they come to be written at all—against the interests of those whom they were intended to serve? Part of the answer is that they were perhaps published after the event, at a later stage in the struggle when the King had already won additional resources and support in practice. The author of the manual or his predecessors might have played a part in this, the manual providing some later literary sanction for the achievement. The confident tone of some well-known manuals suggests that they were just urging a successor to follow the path shown by the manual—which had showered succss on his predecessor. Secondly, many of them are written in such vague suggestive terms as would not give away much to rivals—but might be amplified for the proper recipient by the practised teacher. Not all manuals, however, are entirely devoted to arming the prince against all and

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[9] S. N. Eisenstadt, *The Political Systems of Bureaucratic Empires*, Free Press of Glencoe, 1963, Chapters 1 & 2.

[10] Most Hindu manuals written by Brahmins warn the King against oppressing Brahmins.

sundry; many of them, such as the Hindu and Chinese, warn him about the dire consequences of despoiling some group—affording clear proof that the writers were against drastic changes in the *status quo.*

Manuals in all climes have some features in common. They advise the prince on the general psychological bases of success—such as the need to understand other men's weaknesses and hide one's own. Secondly, they go on to explain in some detail how to apply these basic lessons to other princes and rival forces and rival groups in his own kingdom. Machiavelli concentrates on the former, Bolingbroke on the latter. Thirdly, most of them go into detail about creating and running an administration with proper counsellors and aides. This does not figure in either Machiavelli's or Bolingbroke's work but constituted a substantial portion of all manuals written in the context of bureaucratic empires.

THE HINDU MANUALS

Practically all Hindu political writing from Kautilya's *Arthasastra* down to Sukra's *Nitisara* was in the form of manuals and nowhere else has this form enjoyed as long a vogue. We can make a good guess of the reasons for this. Political writing till the time of Kautilya was incorporated in the general corpus of *Srutis, Smritis* and *Puranas* and was very much in the manual form of advice and injunction but to all and sundry, the house-holder, priest, King and Minister. This was indicative of a society in which each one, exalted or humble, had his due place, duties and rituals. The Kautilyan *Arthasastra*, concentrating on advice to the prince as such, is an important departure—produced by changed conditions. Little kingdoms and republics had given place to the Nanda and Maurya Empires, to a consequent reorganization of territorial units, the rise of groups, such as merchant guilds, and the need for an elaborate bureaucracy. The Maurya Empire began to take on the standard pattern of bureaucratic empires—with a partial separation of things political from things social and the discovery of free resources other than land, such as mines and salt pans, whose produce could be appropriated by the King. Thus fluid conditions were brought into existence in which the prince could amass semi-personal wealth without depending on limited land revenues, further his own policies and interests therewith and canvass support among uncommitted social groups. To do all this, he had to learn more than the Vedic duties and rituals and do more than keep his 'allotted' place. He needed to be alert, tactful, intelligently selfish and well-informed, and to run a vast administration, canvass allies and

defeat enemies. Kautilya's manual provides detailed instruction in *all* these regards, perhaps for the first time.

The practice of writing manuals continued for centuries thereafter, because the bureaucratic state was well established as the prototype of successive Hindu Kingdoms, large or small—and because again the custom of writing manuals was even more ancient than Kautilya's work. There was, however, an important change, in the post-Kautilyan centuries. The gradual and ultimate separation of the political system from the social system which was implicit in the *Arthasastra* was inhibited and arrested in the later centuries. Perhaps, the chief reason was the felt need of Hindu society to preserve an undifferentiated social and religious structure in the face of foreign invasions and penetration. The primacy of *Artha* (wealth or politics) over *Dharma* (virtue) and *Kama* (Love) which Kautilya just started urging—was soft—pedalled in later Smritis, and *Rajadharma* (the prince's duty) became once again an integral part of *Dharma* for all.[11] Hindu political writing thenceforward did not, in general, postulate or encourage the separation and supremacy of the political over the social, implicit in manuals of other bureaucratic empires and explicit in Machiavilli's and Bolingbroke's work. With this important difference the Hindu manuals for the prince had the triple features of manuals in general, to wit, practicality, love of detail and repetition—all in a very exaggerated form. Kautilya's advice is most detailed and down to earth not only in regard to learning self-control and choosing ministers but in regard to the exact amount of the fine for various minor offences. Some of his successors go much further and tell all about how to compose *Sasanas* (King' commands and inscriptions) and *Prasastis* (King's praises) and how to cast icons and even go into some absurd observations on aesthetics. Such practical and detailed advice is not only repeated century after century but within the same book in several places.

In contrast to this repetitious wealth of detailed practical advice, the Hindu manuals did not suffer from any excess of political theory. Indeed, of straight-forward political philosophy there was only the minimum but more was secreted in the interestices of practical advice. But all told, closely argued philosophy was confined to such themes as the origin of Kingship and the justification of the all-embracing, all-sustaining nature of Dharma. Even this was abbreviated considerably in the manuals—and the theory of the seven-limbed state is stated

[11] Professor K. A. Nilakanta Sastri points out (*Illustrated Weekly of India*, 1962) that Kautilya placed *Artha* above *Dharma* and later *Smriti* writers reversed this process. Personally, I feel that even Kautilya was only making a beginning in that direction with his trite dicta about *Arthasastra* being superior to and inclusive of other sciences. The later flood of *Smriti* writing virtually submerged his deviant ideas on the subject. In taking this view, I rely on P. V. Kane, *History of Dharma Sastra*, Vol. III, Chapter I-X and K. V. Rangaswamy Iyengar, *op. cit*.

more as a practical fact than as a hypothesis to be proved or argued about. The strains of Aristotle, Hobbes, Locke and Rousseau are absent, but the Hindu manual writers were certainly more effective in their contemporary society than the "dispossessed" intellectual philosophers of the West. As a dramatic example, one can contrast the word for word effectiveness of Kautilya's injunctions on the running of the Maurya Empire with the way Alexander ignored Aristotle's advice both about city states and the treatment of Asiana.

THE SOUTH INDIAN OR TAMIL CONTEXT

Valluvar's work is well within the broad Hindu tradition but at the same time differs considerably from more orthodox texts and makes a clear attempt to strike out a new path. Let us look briefly into this dual aspect of his work.

Even if we ascribe him to the second century before Christ, he could not have escaped Aryan or North Indian influences which had already commingled inextricably with Tamil culture—as attested by *Purananuru.*[12] There is good reason too to assume that he was a Jain. So he was doubly exposed—to the general Northern influences in the community and to the more intensive influence of the Jain monks from the North. He refers often to a consensus of earlier works to reinforce some of his points—and some of these works at least were in Sanskrit or Pali.[13] The general plan of his great work literally follows the Hindu scheme of life and its objects, *Dharma, Artha,* and *Moksha* (virtue, wealth, love and salvation). Indeed he is not even averse to incorporating the harmless Sanskritic ritual of ancestor-worship as part of one's duty or virtue.[14] The plan of each of his three books follows the broad ideas of similar Sanskrit works; the book on *Kama* (love) deviates most from them—and the middle book on *Artha* (economy or polity) somewhat less.

Within this broad framework, however, he makes important departures. These amount to more than differences of emphasis of detail which are common even among Sanskrit works in the field. His book on Kama or love perhaps owes nothing at all to Sanskrit works which deal only with sex, as the Aryans had no concept of romantic love.[15] In dealing with *Dharma* (duty or virtue), he follows the broad outline of Sanskrit *Smritis*, elaborating man's duty to his parents,

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[12] I am following Vyapuri Pillai, *op. cit.*, in tracing Aryan influences as early as this

[13] T. P. Meenakshi Sundaranar, *op. cit.* He refers to Valluvar's phrases such as *Nulor Thuniphu.*

[14] Couplet 43 of the *Kural.*

[15] T P Meenakshi Sundaranar, *op. cit.* Second part dealing with Kamam. See also Nirad C. Chaudhuri, *The Continent of Circe,* Chapter 10.

family, progeny, the poor, the Gods, teachers and others but he introduces changes of context and detail. Thus Vedic sacrifices are condemned, the externals of monkery, Brahminhood by birth and religious beggary are looked askance at and the preservation of honour is stressed even at the risk of life—in contrast to Bhishma's preachings in the *Mahabharata*. A similar approach is followed in *Porutpaal* dealing with the polity and we shall discuss that in detail presently. But before that we shall indulge in a brief speculation as to the origin of Valluvar's new approach—within the broad Hindu framework.

Indologists are agreed that Hinduism developed after the age of the Rig Veda—through a Dravido-Aryan synthesis of concepts and Gods. We are less concerned with the first synthesis but more with a second unmapped encounter from the first to the 6th century A.D. or more or less stabilized Hindu concepts from the North with a stable local Tamil culture in the South. The Northerners, Brahmins, Jains and Buddhists, brought with them each, two distinct contributions, namely, organized ritualism and a complete philosophy of life and death. The Tamil South, still in the heroic age, as portrayed in the two ancient anthologies had neither of these but had two very distinct traits of its own, namely, heroic chivalry and romantic love. We do not know much about how the Northern and Southern ideas met and reacted but out of this emerged *two new and distinctly Tamil contributions*, namely, *Bhakti* (or devotion to a personalized God) and *Olukkam* or a positive secular system of ethics.[16] We can see the romantic love of *Aghananuru*

[16] This is indeed a subject for future research and the available materials are scanty. My own picture based on intelligent guess-work is as follows: the Tamil heroic age society which cherished romantic love met with Aryan sacerdotalism and speculative philosophy under reasonably equal conditions. The Tamils had held their own against the Aryans who had exhausted their military propensities in the Indo-Gangetic valley, and they had, unaided, put an end to the humiliating occupation of their region by the Kalappalar (Kanarese). Defeat and occupation may produce doubts about cultural self-sufficiency but final victory produces self-confidence and a climate of cultural receptivity. Thus a heroic ethic stressing personal nobility and social virtues can suffer under defeat; the Roman heroic virtues went to the wall when the Empire disintegrated, to be replaced by Christian virtues stressing individual holiness and perfection. During the medieval period the two sets of virtues were kept apart, the knights practising the first and the monks the second—and some synthesis became possible only after the Reformation. In Tamilnad fortunately, Brahmin ritual and Jain austerity met a heroic ethic and a lyrical romanticism when their parent society was still confident. Hence an early synthesis was made possible—and the first book of the *Kural* is the peak of the perfected synthesis—talking crisply of the unparalleled heroism of the virtuous. Simultaneously the practice of romantic love was being slowly modified by new restrictive rituals *(Aiyar Arthana Karanam)* and the advancement of society from hunting and part-time cultivation to organized agriculture. But the ideal was too deeply ingrained to be completely forgotten and took on a personal Lord under the impact of ~~Northern narcissistic and~~ nihilistic philosophies. This was not possible in Europe—when early Christianity, still Hebraic, stressed the power of God above—rather than his immanence, looked askance at love and permitted marriage as a secondary and less holy state. Catholic mysticism developed later, partly as a sublimation of sex and partly as a monastic counter-part of the knightly ethic.

I am dealing in detail with this encounter and the evolution of *Bhakti*, in a forthcoming article entitled *"The Sociology of Bhakti"*.

mellowed and merged into the third *Purushartha* of love in Valluvar's book on *Kama*—bearing no relation to Sanskritic preoccupation with potency and progency. The Tamil concern with positive ethics finds full expression in Tiruvalluvar's book on virtue—which condemns most Northern rituals and ignores other worldy philosophy. The middle book on polity was affected by the encounter rather indirectly but well enough to develop its own approach.

PORUTPAAL AS PART OF HINDU POLITICAL THOUGHT AND AS A STUDIED DEVIATION

We have already explained that Valluvar was, in general, influenced by Aryan concepts and books. We can also see that he was even more specifically influenced by North Indian works on politics. There is good reason to infer that he flourished after Kautilya and that he was familiar with the *Arthasastra* and some Sanskrit *Srutis* and *Smritis*. As a Jain he was probably educated by Jain scholars from the North in all these—perhaps from a highly critical Jain viewpoint. Apart from a general evidence of familiarity with Sanskrit *Smritis* (often by way of refutation) there is clear evidence in *Porutpaal* of Valluvar's deep scholarship in *Arthasastra*. Indeed he begins his work with a clear restatement of the Kautilyan seven-limb theory of the state and the seven sections of his work are devoted to one limb each and all but the last section dealing with the people correspond in broad outline to some part or other of *Arthasastra*.[17] It is in fact impossible to understand some tough and terse couplets without a deep understanding of Kautilya's work, as *Parimelalakar* points out contemptuously to Kalingar in connection with couplet 501.[18]

To accept all this and to point merely to differences of detail (several such differences can be located) seems rather pointless and it looks equally absurd to overdo his concern for the ethical basis of the state, making him look the milksop moralist he was not. He rails against tyranny but he is equally keen to advise the good ruler to use spies, to bide his time with the enemy and to punish the wicked. There is no need to base Valluvar's claim to originality as his blind Tamil admirers do, by stressing his minor deviations from orthodox Sanskrit texts or exaggerating his concern for the moral basis of the

[17] Most chapters of *Porutpaal* can be matched with passages in the *Arthasastra* except the last seventeen chapters on the people and the odd Chapter 78 in the Tamil heroic *Purananuru* tradition.

[18] This couplet condenses a whole chapter (10, Book 1) of *Arthasastra* on the testing of ministers. Evidently, Kalingar, a Jain and an earlier commentator not acquainted with *Arthasastra*, misinterpreted it in a queer way. Parimelalakar, better versed in Sanskrit works, does not spare him for this.

state. He kept well within the Hindu political tradition but introduced a new approach within the old general framework without challenging it fundamentally, and carefully refrained from giving a new name, to his own framework. We shall now try to highlight the basic points of his new general approach.

VALLUVAR'S NEW APPROACH

This new approach becomes evident, as soon as we look into the large amount of Sanskritic material that is (presumably deliberately) omitted. The following list, which is more illustrative than exhaustive gives us an idea:[19].

I. *The King*

(1) Origin of Kingship
(2) Right of succession
(3) Classification of rulers, Chakravartin to chieftain
(4) Classification of conquerors
(5) Dvairajya or dual Kingship
(6) Yuvaraja or prince
(7) The King's daily routine
(8) Details of his education
(9) The procedure of coronation; and
(10) Safeguards against poisons and plots.

II. *Counsellors*

(1) Classification of Ministers
(2) Names and duties of high officers of State
(3) Their salaries and allowances
(4) Superintendents of departments and their salaries; and
(5) The Purohita and his duties.

III. *Administration*

(1) Sections of the Kingdom
(2) Administration of villages
(3) Administration of the capital city

[19] The list was compiled from P. V. Kane, *History of Dharma Sastra*, Poona, Bhandurkar Oriental Research Institute, 1930 (Vol. III, Chapter I-X on Rajadharma).

(4) Administration of merchant guilds
(5) Principles of taxation and different kinds of taxes; and
(6) State monopolies such as salt and mines.

IV. *Army*

(1) Different kinds of armies
(2) The four elements of the army
(3) The details of their constitution and arrangement in battle
(4) Accepted conventions of warfare
(5) Classification of Indian weapons and their use
(6) The various Grihya rites before going to battle; and
(7) The interpretation of dreams before battle.

V. *Diplomacy*

(1) Classification of allies
(2) The six gunas and the four upayas
(3) The famous Mandala theory of Kautilya; and
(4) The details of disguises for spies.

VI. *Other Forms of Government*

(1) Republics
(2) Dvairajya or dyarchy; and
(3) The Sabhas, Samitis and Paura Janapadas.

These rather large omissions are obviously made for one of the three reasons:

(*a*) because they are just details; or
(*b*) they are irrelevant to the context of Tamilnad and the general scheme of his work; or
(*c*) They would be contradictory to or at least incongruous with his main thesis.

Details of administration and battles would fall under (*a*), the Mandala theory would fall under (*b*), while subjects like Purohita and Dvairajya would come under (*c*). The omissions on analysis seem to be quite deliberate and indeed more important than his few statements directly contradicting Sanskrit works. They also give his work a non-polemical and internally harmonious approach.

Let us first investigate his aversion to going into dull details. *Porutpaal* differs from the *Arthasastra* as well as from other Sanskrit works on politics by its high level of generality and abstraction and an almost scrupulous avoidance of examples and contemporary details. To illustrate this, we may compare its treatment of three subjects, namely, (*a*) cultivation of self-control by the King, (*b*) appointment of ministers, and (*c*) fortresses—with their treatment in the *Arthasastra*. Chapter 3, Book 1 of the latter deals with restraint of the organs of sense and in particular with the shaking off of six enemies, namely, lust, anger, greed, vanity, haughtiness and overjoy. To drive home the evils of non-restraint Kautilya devotes more than half the chapter to giving twelve examples of those who perished through non-restraint and two examples of those who flourished through restraint. In contrast to this valluvar discusses the need for self-restraint in a short chapter titled contemporary examples, but more philosophically.

Regarding ministers, Chapter 10 of the first book of the *Arthasastra* gives the following detailed instruction to the King about testing the character of his Ministers by offering them a religious allurement among other temptations: [20]

> The King shall dismiss a priest, who when ordered refuses to teach Vedas to an outcaste person or to officiate in a sacrificial performance (apparently undertaken by an outcaste person). Then the dismissed priest shall, through the medium of spies under the guise of classmates, instigate each Minister, one after another saying on oath "This King is unrighteous; well let us set up in his place another King who is righteous, or who is born of the same family as of this King, or who is kept imprisoned, or a neighbouring King of his family and of self-sufficiency, or a wild chief, or an upstart; this attempt is to the liking of all of us—what dost thou think?" If any one or all of the ministers refuse to acquiesce in such a measure, he or they shall be considered pure. This is what is called religious allurement.

Valluvar compresses all this into one couplet (501). He discusses later the testing of all colleagues and subordinates in two chapters, 51 and 52 and concludes aptly: "Choose not anyone without testing, but having chosen, suspect not those you have chosen. Endless sorrow follows both choosing without testing and suspecting the properly chosen."

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[20] R. Samasastry, *Kautilya's Arthasastra*, Mysore, Sri Raghuveer Printing Press, 1951, pp. 15-16.

A more interesting example of generalized treatment is Valluvar's discussion of fortresses, which is general without omitting anything important and useful. According to Professor T. P. Meenakshi Sundaranar, Valluvar deliberately avoids going into details of construction, provisioning and development of soldiers, since these were bound to change with the advancement of engineering and strategic studies.[21] He is almost alone in adopting such restraint (to two Chapters) as against Kautilya and several classical authors in Sanskrit and Tamil, all this in spite of the advanced state of fortress engineering in Tamil country, using all the devices invented by Archimedes.

This method has the advantage of applicability to all times and all conditions and of focusing attention on the absolutely relevant. Its disadvantage is that over-generalising leads to misinterpretation in the hands of less discerning readers even as Kautilya points out rather cynically in the introduction to his *Arthasastra*.[22] And much of Valluvar's advice to Kings has been ladled out in South India in recent times with homiletic eloquence to would-be business tycoons, politicians and careerists. It has also allowed commentators to read meanings which he could not have intended. But Valluvar was perhaps looking further than balancing these disadvantages and advantages, towards setting a new trend in political writing. It would not have done to give up writing manuals altogether in those days, but a little more generalization of the detailed advice into some basic principles might have in course of time led to a more fundamental school of political philosophy. Such an inference is also supported by his omission of Sanskritic material not only when it was mere detail but also when it was incongruous with his general thesis of a non-ritual secular ethic. Valluvar combined two advantages in pioneering this new approach. He was not attached to any court and had an amount of intellectual freedom and initiatve denied to writers in royal service. Secondly, he was making a grand new synthesis of virtue, polity and love and could see more widely and clearly than mere teachers of statecraft. However, the trend he set was not followed. But more of this later.

In tune with its basic purpose of inaugurating a new harmonious approach *Porutpaal* follows a more intelligible arrangement of material than most other Hindu manuals.[23] Starting with a re-statemnt of the

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[21] T. P. Meenakshi Sundaranar, *op. cit.*, p. 93, and also Chapter 15-16.

[22] "Having seen" says Kautilya rather facetiously, "discrepancies in many ways on the part of the writers of commentaries on the Sastras, Vishnugupta (the author's alternate name) himself has made this text and commentary". R. Samasastry, *op. cit.*, p. 463.

[23] The lack of arrangement of Hindu manuals has been commented on by J. S. Mill. See also Nirad C. Chaudhury, *op. cit.*, paperback edition, p. 103.

seven-limb theory of the State, it deals with each of them successively in the seven parts into which the book is divided. The middle book also blends harmoniously with his first book on virtue, based on broad humanism and his last book on love, based on a life-enriching mutual devotion—without immersion in sex-technique—through basing the polity on the minimum necessary social coercion and the minimum use of violence and cunning on the part of the ruler. In the same spirit, Valluvar deals mainly with *personal* virtue under *Aram* (virtue) and with social virtues, such as the nobility of work, firmness in adversity, forgiveness, honour and magnanimity, under polity. In the same vein again, he deals with true love in the last book on love and with the dangers of infatuation in the middle book on polity.

His General Political Philosophy

Porutpaal, like all other Hindu works on polity, broadly attempts to frame a workable scheme of society by basing it on a morally controlled monarchy, and differs from them in regard to means rather than ends. All Hindu political writing was based on a realistic assessment of contemporary human development. The republics and semi-democratic chieftaincies had failed to control internal dissension and external aggression and the need was clear of concentrated power to bring order. The *Arthasastra* settled firmly for a strong and expanding monarchy supported by a bureaucracy—and practically all later writings followed this line.

But within this agreed framework there was the perennial problem of controlling the king for which Hindu writers offered no institutional solution. It was necessary and proper to arm him with *Danda* (total coercive power of the community) to fight external aggression and internal dissension. But to control his abuse of *Danda* against the people themselves, Hindu polity could offer only the concept of *Dharma* or universal law. In theory the King ruled as its vice-regent and it protected him only so long as he upheld it. But there was no powerful Catholic Church as in medieval Europe to place its power and influence behind universal law—which was interpreted in India by an unorganized priesthood. The *Srutis* and *Smritis* threatened erring monarchs with the direct consequences here and hereafter and reinforced their warnings with stories about the fall of the mightiest, such as Indira and Nahusha. Widespread popular belief in all this provided some measure of control. But with the support of even a section of the priesthood, the King could have much his own way.

Valluvar broadly accepts monarchy and the supremacy of *Dharma*—and predicts ruin for a tyrant. But his version of *Dharma* is different

in two regards; it is based more on humanism and less on ritual with its heavenly reward and the Brahmin occupies a rather minor place in society with the Purohita (royal priest) being studiedly omitted in his treatment of polity. He thus removed the one (not too efficient) check on the King namely the law-interpreting priest. What did he put in his place? Part of the answer to this question is that he was not concerned overmuch in putting someone in his place, for he was writing in a calmer and more equalitarian social climate in South India and was less obsessed with the problem of controlling an erring monarch. Secondly, he may have thought of the large class of cultivators as a corporate checking agency. This class had been praised by many Tamil poets as the bulwark of society and Valluvar caps their verses with his couplet (1033) that they alone live while others are parasites. They had sanctions, such as mass emigration to another state and could collectivey constitute a check on tyranny. Their importance in Valluvar's scheme of things is also brought out through his devoting to them a separate section of seventeen chapters—a unique phenomenon among Hindu works on polity. These Chapters are taken up mostly with social virtues, some with their roots in the Tamil heroic age. Thus Valluvar's concept of honour (above life), shame (at unworthy deeds) and firmness in adversity (dread of beggary) are drawn from the *Purananuru* heroic virtues while his discussion of magnanimity and his contempt for anti-social behaviour draw from the same source and are reinforced by the need for social cohesion.

We have referred to the calmer political and social climate of Tamilnad. This is reflected in Valluvar's treatment of war and diplomacy in both of which he advises great caution. His discussion of a war—of conquest or defence—centres on making small gains or making good small losses. This flowed from the more settled conditions of South India compared to the North. The latter was, before the time of Kautilya in a state of disequilibrium, with a number of kingdoms and tribal republics changing their borders frequently. The unification of this vast flat Indo-Gangetic plain seemed to Kautilya a natural and desirable ideal. He urges the energetic prince to go after it, by deceit and aggression if need be—as North India was *Chakravarti Kshetra* the the natural arena for empire. In contrast, Tamilnad was divided into the three Kingdoms of Chera, Chola and Pandya with stable dynasties, and this arrangement was popularly considered as eternal as the sun and the stars—despite intermittent wars and border readjustments. Valluvar's work reflects this popular belief in a stable equilibrium and is less interested in conquest and empire.

All this does not amount to a new political thoery. Valluvar was well within the Hindu monarchist tradition and the modifications he

introduced were not an immediate challenge to the fundamentals. We have discussed the crucial modifications in approach and content, and consider these as more significant than the few open refutations of some North Indian concepts. Valluvar thus offered a real point of departure with his modified system for a new school of political philosophy.

But it was not taken up by any subsequent writer. He suffered ultimately the same fate as Lord Buddha in being absorbed back into the mainstream. All Tamil poets praised him and his work, some great successors borrowed freely from his rich phraseology and imagery but there are no indications of princes and potentates being influenced by him. No stone inscription, *Prasati* or copper plate seems to refer to him and no prince called himself a follower of the *Kural*, while many boasted of following the *Manu Smriti*. It was perhaps in this atmosphere that commentators, such as Manakkudavar and Paripperumal, read back into his couplets, some of the North Indian concepts which he studiously avoided.[24]

Why did this happen? Valluvar himself did not make an outright bid to get away from the mainstream for good reasons—and this made his reabsorption easier. As the work of a Jain the *Kural* perhaps suffered the same process of slow erosion as Buddhism did in the rest of India. The *Porutpaal* in particular suffered perhaps more—because Brahmin priests were penetrating South Indian royal courts almost simultaneously with *the Kural* and they had more to offer the King by way of resounding Sanskrit titles, social legitimation and occult sciences. They were evidently no great admires of *Porutpaal*, partly because of its studied neglect of their tribe of purohitas and they had no interest in selling its somewhat deviant ideas about the importance of the tiller of the soil and people in general. Long before Sekkilar made an official effort to banish Buddhist and Jain classics from the Tamil curriculum[25], *Porutpaal* had suffered polite neglect for several centuries. It is sobering to reflect that a most promising point of departure in Indian political writing was never followed up.

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[24] It is amusing to find these two commentators including a Purohita in the list of elders to be consulted, wherever the original deliberately omits him, as in Chapter 45.

[25] In the 12th Century, Sekkilar, a minister of Kulottunga Chola III and a devout Saivite was outraged by the practice of learning Jain classics for their literary merit and accepted challenge to compose a Saivite classic—the story of Siva's devotees.

N.B. This paper is the introduction to a critical edition of *Porutpaal* including a summary of the commentaries—which is being published by the Author shortly.

PATERNALISM IN INDIAN ADMINISTRATION : THE NON-REGULATION SYSTEM OF FIELD ADMINISTRATION UNDER THE BRITISH

Haridwar Rai

THERE prevailed two systems of field administration in India under the British—the regulation system and the non-regulation system, each characterised by a distinct administrative ideology. The regulation system was in force in the older provinces governed by the laws made under the Charter Acts, which were called 'Regulations' until 1834, when the more modern designation of 'Acts' was adopted.[1] For the enforcement of these laws there was an elaborate chain of courts with strict and elaborate rules of procedure. The non-regulation system was employed in less advanced areas acquired at a later time and inhabited by aboriginals or 'wild', martial and less 'civilised' people, in which the introduction of the ordinary law with its formalities and more elaborate procedure was considered inadvisable. The procedure of law courts in the non-regulation provinces was 'of simple and summary form, but not necessarily less precise and definite'.[2] Such tracts were accordingly excluded from the operation of the Regulations in force in more settled and advanced areas and came to be generally ruled in accordance with simpler codes based on the spirit of the Regulations but modified to suit the circumstances of each 'special' area.[3] The regulation system of administration was in force in Bengal, the North-Western Provinces, Madras and Bombay, where as the non-regulation system prevailed in the Punjab, Oudh, the Central Provinces and Burma. The areas were thus distinguished into regulation and non-regulation in accordance as they were originally administered

[1] It may be noted that the original method of legislation, up to 1834, was by Regulations issued by the Executive Councils of Fort William (Calcutta), Fort St. George (Madras) and Bombay. In 1793, the issue of formal and definite legislative enactments began in the series of laws known as the Bengal, Madras and Bombay Regulations. Since 1833, the term Regulation had ceased to be used; the laws came to be called, as in England, 'Acts'.

[2] George Chisney, *Indian Polity*, London, Longmans, Green & Co., 1894, p. 187.

[3] *See* L. S. S. O' Malley, *The Indian Civil Service*, (1601-1930), London, John Murray, 1931, pp. 48 60; John Strachey, *India: Its Administration and Progress*. London, Macmillan & Co., 1903 pp. 91-94; *The Imperial Gazetteer of India*, Vol. IV., Oxford, Clarendon Press, 1909 pp. 33-47; and W. W. Hunter, *The Indian Empire*, London, Smith, Elder & Co., 1892, pp. 512-513.

under Regulations framed under the Charter Acts or under less formal codes.

The pattern of administration adopted in non-regulation areas was paternalist. It was characterised by 'simple and more direct modes of procedure and by the greater accessibility of officials to the people; but chiefly by the union of all powers, executive, magisterial and judicial, in the hands of the district officer, here termed Deputy Commissioner in place of Magistrate and Collector, subject, however, to the appellate jurisdiction of the Commissioner of division in all branches of work'.[4] Being paternal rather than formally legal, this system of administration depended for its successful operation, in large measure upon the personal qualities of character, initiative and vigour.[5] The administrative staff in these areas consisted partly of civil servants drawn from the regulation areas by the prospect of more rapid promotion, partly of military officers withdrawn from their regiments and to some small extent of officials promoted from subordinate positions. However, the elements of administration in such areas were predominantly military with the civilian part occupying a secondary position. Military officers were at the same time required to conform to the 'principles and spirit' of the Regulations and to act according to justice, equity and good conscience in cases not covered by laws and rules.[6] The ideology of the paternalist non-regulation system was thus characterised by three features:

(*a*) The concentration of authority and responsibility in the Deputy Commissioner, the combination in one person of the administration of civil justice and of revenue being thought to be essential for the preservation of the indigenous system of land tenures.

(*b*) The districts must not be so large as to make the undivided responsibility impossible and they must be small enough for the District Officer to get a complete knowledge of them and the people.

(*c*) The administration was grounded on a set of simple laws and rules, which were not intended to upset or 'anglicize' the Indian institutions.

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[4] *The Cambridge History of India*, Vol. VI, H. H. Dodwell (Ed.), Delhi, S. Chand, (the first Indian reprint), p. 87.

[5] Most of the British civilians in India believed with John Strachey that 'when the people had never been accustomed to anything but personal rule of the roughest sort, it was often necessary, on the introduction of our government, to concentrate executive and judicial authority in the same hands. Government, by regular course of law, cannot be substituted in a moment for a Government of irresponsible power'. See *op. cit.*, p. 93.

[6] See J. Thomas Prichard, *The Administration of India, 1859 to 1868*, London, Macmillan & Co., 1869, p. 157. *See* also George Chisney, *op. cit.*, pp. 187-188.

THE SINDIAN NON-REGULATION SYSTEM

Though the rudiments of the non-regulation ideology were to be found in the Deccan and the Delhi systems of Elphinstone and Metcalfe, the system as such was first practised and perfected by Charles Napier in the conquered territories of Sind.[7] A veteran, "trained under the Duke of Wellington, and imbued with all the master's love of discipline and promptitude".[8] Napier perceived that "too much civilianism would be the ruin of Sind"[9], and accepted avidly the suggestions of Ellenborough, the Governor General, that there should be as little change as possible, to begin with, except in the spirit of the Government.[10] The suggestions for establishing some sort of a Commissioner system were to this effect:

> "The Mir's system of farming out their revenue, though bad, must unavoidably be continued at first, it would be as well to divide the country into districts, placing over each an officer who should control and prevent injustice by the tax-farmers, while protecting them in the task of obtaining the revenues. Such commissioners with full powers, making use of native agency, had done good work in other newly conquered territories, because care had been taken to select the ablest men. Sir Charles Napier would, of course, endeavour to choose officers whose abilities and character would render them safe depositaries of great power."[11]

Filled with even a stronger anti-civilianism, Napier characterised covenanted civil servants as "ignorant of great principles, devoid of business habits, wasteful and greedy for jobs and ease, rub by nepotism, grossly overpaid and demanding swollen costly establishments".[12] He got rid of the civil servants who had been sent to administer Sind on its annexation and transferred the entire judicial and revenue

[7] Sind was annexed by the British in 1843.

[8] Edward Thompson and G. T. Garrat, *Rise and Fulfilment of British Rule in India*, Allahabad, Central Book Depot, 1954, p. 316.

[9] J. W. Kaye, *The Administration of the East India Company*, London, R. Bentley, 1853, p. 435.

[10] Ellenborough was opposed to division of power at any level of Government. He liked soldiers as much as he disliked civilians, and during his administration, he substituted army officers for the covenanted civilians wherever it was possible for him to do so. See Richard Temple, *Men and Events of My Time in India*, London, John Murray, 1882, pp. 24-25. See also *British Attitude Towards India*, London, Oxford University Press, 1961, p. 185.

[11] H. T. Lambrick, *Sir Charles Napier and Sind*, Oxford, Clarendon Press, 1952, pp. 179-180.

[12] E. Thompson and G. T. Garat, *op. cit.*, p. 320.

administration to the hands of the soliders.[13] He himself took charge of the entire revenue and judicial administration of Sind and added much stronger doses of anti-civilianism to the traditions of field administration than had previously been done by Elphinstone and Metcalfe in the Deccan and the Delhi systems.[14] He described the character of his non-regulation system in these words:

> "It is in fact a military one so mixed with the Sindian system that the only change the people can observe will be that instead of a dozen Amirs there will be one Governor, and instead of a host of favourites surrounding each Amir there will be about fifteen or twenty responsible people protecting them from robbers and listening to their complaints".[15]

THE PUNJAB NON-REGULATION SYSTEM

The ideology and technique of the Sindian non-regulation system were employed, in modified form, in the management of territories acquired on the annexation of the Punjab in 1849. The alternatives which presented themselves as to the pattern of administration to be adopted for administering these tracts were:

(*a*) a purely military form of government, as adopted for Sind; and

(*b*) the precedent afforded by the earlier and more settled regulation provinces.[16] Without having prejudices for or against either, Dalhousie, the Governor-General, recognised the merit of both, and, accordingly 'struck out for himself a mixed form of Government which should combine military strength with civil justice; and erected an administration composed in equal proportions of trained civilians and military officers'[17] His was a system of mixed elements—a judicious intermixture of civil

[13] Charles Napier's contempt of young civil servants is epitomised in these words: "Young and often very incapable men are sent to acquire experience and fortune ... by mis-governing newly conquered countries. Unknowing how to rule even a settled country, they have to create every branch of administration and must necessarily manipulate roughly ... when the nicest touch is essential". Of the old civilians he wrote: "length of residence and sexual indulgence weaken body and mind and give only aptness for official details without enlargement of ideas ... " See J. W. Kaye, *op. cit.*, p. 434, F.N.

[14] Thompson and Garrat have opined that Napier 'Set the model which the world famed Punjab tradition was to copy and amplify a few years later'. See *op. cit.*, p. 320

[15] *See* H. T. Lambrick, *op. cit.*, pp 190-191. Philip Woodruff also has remarked that it was a pure and simple military Government, 'Government by soldiers untainted by experience of politics and administration'. See *The Men Who Ruled India*, Vol. I, London, J. C pe, 1953-54, p. 325

[16] R. Boseworth Smith, *Life of Lord Lawrence*, Vol. I, Smith, Elder & Co , 1883, p. 280.

[17] W. W. Hunter, *The Marquess of Dalhousie*, Oxford, Clarendon Press, 1890, p. 86

> and military elements—one in which civilians and soldiers might meet on equal terms as executive officers.[18] He sought to unite military strength and promptitude with civilian exactitude in justice and vigilance in administrative details. And yet he decided initially to govern the Punjab not by one man but by a board of three, a triumvirate. But the members of the board were to be drawn from both the branches of the service, and were to work under the system of what may be called 'divided labour but common responsibility' [19]

However, the board of three was intended to be a temporary arrangement: to achieve the object of 'pacification'.[20] For the work of organisation, the choice of Dalhousie fell upon John Lawrence, who was appointed Chief Commissioner of the Punjab, with power to direct all the branches of the executive, besides the authority to manage the political relations with the adjoining states, and to exercise general control over the frontier force and the military police. Under him were placed two 'Principal' Commissioners, one controlling the judicial and the other the financial departments of the State. Here was erected a replica of the Delhi system of Metcalfe; a completely unitary structure of government was established; the principles underlying it were the very essence of despotism. The system implied that the administration should be conducted according to the spirit of the 'Regulations' rather than by the letter. The cardinal principles of such a system of administration were already laid down by Henry Lawrence, the brother of John Lawrence, which the latter accepted as his lodestar.[21]

CHARACTERISTICS OF THE PUNJAB NON-REGULATION SYSTEM

The administrative ideology of the Punjab non-regulation system included three elements.[22] There was, in the first place, concentration

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[18] J W. Kaye, *op. cit.*, p. 450.

[19] R. B. Smith, *op. cit.*, p. 281.

[20] Napier frowned upon the Board of Three on the ground that 'a Board rarely has any talent'. Some others felt that it 'was self condemned from its conception'. A Board is in itself a compromise and therefore cannot possibly have the unity, the rapidity, the concentration, the individuality, which a simple mind can bring to bear on those whom it governs See *ibid.*, p. 281.

[21] Henry Lawrence had proclaimed:

> "In a new country, especially a wild one, promptness, accessibility, brevity and kindliness are the best engines of government. Have as few forms as possible and as are consistent with a brief record of proceedings. Be considerate and kind, not expecting too much from ignorant people Make no change unless certain of deciding improvement in the substitute—light assessment, considering the claims and privileges, even when somewhat extravagant, of the privileged classes, especially when they affect Government and not ryot." *See* L. S. S. O'Malley, *op. cit.*, p. 57.

[22] *See* Charles Aitchison, *Lord Lawrence*, Oxford, Clarendon Press, 1892, pp. 60-61.

of authority and responsibility in the District Officer, who was not only magistrate and collector but also judge. Under the Sikh rule, the people had never been accustomed to separation of functions, since all powers at the local level centred in the *Kardar*. 'For us' felt John Lawrence 'to have introduced a multiplicity of authorities would only have perplexed them,' [23] Accordingly, every civil functionary from the highest to the lowest, in due order of subordination, was vested with all these three powers—judicial, revenue and magisterial. He was opposed to the separation of judicial functions from those of the collector of revenue, because he desired the District Officer to be 'a kind of a terrestrial providence'.[24] He directed that in each unit of territory there should be a recognised head with full powers to govern so that the *tradition of personal rule* to which the people in the Punjab, according to him, had been long accustomed could be perpetuated and what he regarded as the indigenous system of land tenures could be preserved.

The second element of this non-regulation ideology lay in the division of the country into district, so small in respect of area, population and revenue, that it was possible for the Deputy Commissioner (this is how the District Officer became known in the Punjab) to gain a complete knowledge of the district and to become personally acquainted with all the men of influence and standing. The most important duties of the Deputy Commissioner were not discharged in 'the stifling cutchery at the central station, but rather in that cutchery of horseback' or under the easily shifted tent, which formed his 'locomotive home' during some five months in the year.[25] His ideal Deputy Commissioner was to show himself 'to all his people continually', to decide cases 'sitting on horseback in the village gateway, or under a tree outside the village walls, to write his decisions on his knees, while munching a native chapati or a fowl cooked in a hole in the ground; and then mount his horse and be off to repeat the process in the next village. Heat, sun, rain, climatic changes of all sorts were to be matters of indifference to him'.[26] The motto was that the Deputy Commissioner as the symbol of empire must always be ubiquitous, and must know everything affecting the welfare of his people. A good stable was a necessary part of his

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[23] Chanels Aitchison, *op. cit.*, pp. 61-62.

[24] Michael Edwardes, *The Necessary Hell*, (London Cassel, 1958), p. 58. John Lawrence, says Edwardes, looked upon the District Officer or the Deputy Commissioner as 'the immediate instrument of rule . . . the symbol of rule'. Erik Stokes remarks that the combination of judicial, fiscal and magesterial powers in the hands of the Deputy Commissioner was justified on 'the grounds of economy and as a means of securing the maximum energy and unity of purpose'. See *The English Utilitarians and India*, Oxford, Clarendon Press, 1959, p. 243.

[25] R. B. Smith, *op. cit.*, p. 55.

[26] John Beames, *Memoirs of a Bengal Civilian*, (ed.) Philip Mason, London, Chatto and Windus, 1961, pp. 102-103.

accoutrements, a feeling of 'settled life' was out of tune with his duties, and a desire to be always accessible to the people was an essential element of his training.[27]

The Punjab non-regulation ideology, in the third place, believed in preservation and was against large scale innovation. Consequently, the Punjab system was marked by simple kind of laws and procedure approximating as far as might be to native customs and institutions. The District Officer was instructed to decide all cases by the light of common sense and by his sense of what was just and right. The Judicial Commissioner issued, from time to time, printed circulars with directions as to the procedure to be adopted in doubtful or difficult cases. Another equally high-placed officer, the Financial Commissioner, issued circulars regarding taxes. On the whole, however, the procedure was simple and expeditious. It was supposed to be based on the system of revenue and judicial administration under the Sikh rule when there was no written law, and disputes were mostly settled by arbitrators in accordance with the customs of the people. It was, however, not a government without law, for John Lawrence always regarded rules and regulations as necessary, though constantly emphasised that everything depended upon a vigorous and paternal executive.[28] Accordingly, local executives 'acting at great distance in unsettled country were knit together into a highly disciplined force'[29] and the Punjab system came to symbolise a remarkable blend of unlimited power and rigid discipline.[30]

EFFECTS OF THE MUTINY ON THE NON-REGULATION SYSTEM

The Mutiny tended to enhance the respectability of the ideology of the paternalist rule of the Punjab system, because its success 'in stemming and hurling back the tide of revolt seemed to argue for it an

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[27] "His ideal of a district officer" to quote Beames, "was a hard active man in boots and breeches, who almost lived in the saddle, worked all day and nearly all night, ate and drank when and where he could, had no family ties, no wife or children to hamper him and whose whole establishment consisted of a canebed, an odd table and chair or so and a small box of clothes, such as could be slung on a camel". See *Ibid.*, p. 102.

[28] L. S. S. O'Malley notes one of his maxims in these words: "Do a thing regularly and legally if you can do it as well and vigorously in that way as irregularly and illegally". See *op. cit.*, p. 58.

[29] Eric Stokes, *op. cit.*, p. 245.

[30] "In the Punjab" to quote Eric Stokes, "all governmental powers, both administrative and judicial, were kept united in the hands of individual officers who were organised into a closely disciplined and graded hierarchy. The Punjab was divided into divisions and districts, each under a single Commissioner and Deputy Commissioner. No separate judiciary was established. The Deputy Commissioner acted as collector, magistrate and civil judge". *Ibid.*, p. 243.

intrinsic superiority over the Regulation pattern of administration'.[31] Many Englishmen were inclined to believe that the hostility shown by the people towards the courts was an index to their preference for a simple, paternalist form of administration. The Punjab system, Raikes claimed, "is so simple, so powerful, so entirely adapted to the genius of the people, that it must, like truth, prevail, and sooner or later extend over the entire peninsula'. We cannot, he continued, any longer try to rule Asia on the constitutional principles of Europe. 'However much philosophers may sneer, a 'paternal despotism' is not only the happiest, but the only regime for India".[32]

The Bengal Regulations, in particular, seemed to have lost much in prestige and an influential section of the key civilians in Bengal had become convinced that the absence of the union of the executive and judicial functions in the hands of the District Officer was the chief cause of the weakness of the regulation system of Bengal. The enunciation by Cecil Beadon of the theory of 'oriental government' at this psychological moment appeared to be an important victory of the ideology which informed the non-regulation system. 'The true theory of Indian Government' he observed, 'is the entire subjection of every civil officer in a division to the commissioner as the head of it, and the entire subjection of every officer in a district to its executive chief.' He argued that since the main duties of covenanted English officers in India were those of superintendence and control, they could be best and most effectively performed for the common weal when they were centred in one authority within a given tract of country.[33]

Most officers urged the Government to build a new and streamlined structure upon the ruins of the old judicial system. As Bartle Frere pointed out, 'we have enveloped ourselves in rules and regulations till we have left ourselves no power of individual action. We have guarded ourselves against doing evil till we have left no power of doing good. The remedy is very simple, though not easy, for it is opposed, not only to existing habits and prejudices, but to all our English ideas of government.... Throughout your whole machinery of government... let every official be a real ruler in all things to those below him, and let him be really ruled by the functionary above him'.[34] The Rent Act of 1852 which gave exclusive jurisdiction over rent suits to revenue authorities and the union of judicial and executive functions in the hands of the

[31] Eric Stokes, *op. cit.*, p. 268.

[32] Thomas R. Metcalf, *The Aftermath of Revolt, India*, 1857-1870, Princeton, Princeton University Press, 1965, pp. 250-252.

[33] *Parliamentary Papers*, 1857, Vol. LIX, pp. 298 *et seq.*

[34] Thomas R. Metcalf, *op. cit.*, p. 258.

Bengal District Officer in the same year were other important gains of paternalism. Even at the highest levels of government, the Mutiny brought into sharp relief the merits of paternal rule when John Lawrence was appointed as Viceroy in 1864. 'He retained undiminished the idyllic paternalism of his Punjab Years' and even insisted that the only form of Government for India was 'personal administration by a single head without a council'. The experience of the Mutiny only reinforced his conviction.[35]

Even Fitzjames Stephen, far from being a champion of the paternalist rule of the Punjab variety, advocated the combination of the efficient rule of law with the unity, energy and strength of *personal* government and controverted the views of those who held that the rule of law implied rejection of the oriental conception of Government. To him a non-regulation system was as much a Government by law as a regulation system: the difference was between one kind of law and legal administration and another rather than between government with law and government without law.[36] He was constantly at pains to counter the popular prejudice that strong government and a highly developed law system were incompatible and remained unaffected by "the assertions, then beginning to rise about the ears of the British in India, that it was a valid criticism of the *Raj* that did not represent the native principles of life or of government. Certainly it did not...It could never do so, 'until it represents heathenism and barbarism'."[37]

LATER DEVELOPMENTS IN THE NON-REGULATION SYSTEM

But with development in education, in means of communication and in legislative activity in the decades following the Mutiny, 'paternalism found itself running into an alien world with bureaucratic efficiency and expertise gaining at the expense of simple, personal rule'.[38] The Penal Code and the Code of Criminal Procedure enacted between 1859 and 1861 not only tended to introduce technical refinements of English law but also uniformity in the administration of criminal justice in British India. Codification was extended to practically every branch

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[35] Thomas R. Metcalf, *op. cit.*, pp. 259-262.

[36] Fitzjames Stephen, Law member of the Government of India (1869-72), favoured the union of powers in one hand so long as nothing was attempted which a single officer could not do; but once that point was reached, the so-called non-regulation system became less efficient than the regulation system. See *Selections from the Records of the Government of India*, Home Department, No. CXXXVI, Calcutta, Superintendent of Government Printing, 1877, pp. 1-94.

[37] A P Thornton, *The Habit of Authority: Paternalism in British History*, London, George Allen & Unwin, 1966 p 1660.

[38] Eric Stokes, *op. cit.*, p. 269.

of the administration in the form of manuals and proved instrumental in systematising the administration and to a certain extent in making it uniform for different areas. Once these codes and manuals were in force, the movement to extend the non-regulation system of the Punjab to other provinces lost much of its momentum. The establishment of the Chief Court at Lahore in 1866 was a sign that 'circumstances were proving too strong, and the rising flood of litigation would eventually have to be met by the institutions of a separate judicial branch'.[39] In fact, judicial functions were gradually transferred to separate officials. The Deputy Commissioner retained as magistrate a limited criminal jurisdiction, but he was gradually relieved of the task of hearing civil suits save those arising between landlord and tenant. The Commissioner's jurisdiction in like manner was transferred to divisional judges, who came, in course of time, to correspond closely with the district and sessions judges of the regulation provinces. Thus, the personal element in district administration which had been the mark of the non-regulation provinces was slowly replaced by much the same rule as had been established elsewhere. The scope for individual initiative was reduced, and the distinction between the more advanced and settled non-regulation provinces and their regulation counterparts tended to vanish except as regards certain differences in administrative arrangements.

Though the paternal rule declined from wide areas as a whole, it did not disappear altogether. There were numerous hilly tracts in the various provinces, inhabited by primitive tribes wholly unaccustomed to regular administration. These were unsuited for the elaborate system of government which had been established in the older provinces. Accordingly, a statute of 1870 and an Indian Act of 1874 provided for certain elasticity in the administration of such areas as the Santhal Parganas, Chotanagpur and some others in other provinces. The first law permitted the Secretary of State to 'schedule' districts within which the Governor-General in Council should have authority to make binding regulations. The second enabled the government to declare in cases of doubt the law in force in such 'scheduled' areas. In these restricted areas the system of paternal rule and union of powers which had characterised the non-regulation provinces persisted in all its force, despite its disappearance as a mode of provincial government.

The policy adopted in such areas was to introduce into their administration "a large portion of the element of human discretion, first by the government taking to itself the power of extending to or withdrawing from them such of the ordinary laws as it believed suitable

[39] Eric Stokes, *op. cit.*, p. 269.

or unsuitable to local circumstances, second by enacting special measures applying to them alone, and third by giving to the officers administering the law and rules a wide discretion in the application of them".[40] In such areas, the land revenue systems in particular were marked by great diversity and there were survivals of a simpler and more primitive procedure.

Paternalism in the Administration of a Non-Regulation Tribal District: The Santhal Parganas

The Santhal Parganas[41] was one such district whose administration was characterised by paternalism and non-regulation ideology. It did not exist as a separate unit in Bengal (it is now a district in Bihar) till 1855, when by Act XXXVII of that year it was carved out of portions of Bhagalpur and Birbhum districts and constituted a separate charge. This Act was a direct result of the Santhal insurrection of 1855. An enquiry into the causes of this rising had shown the unsuitability of the regulation system to that district and had demonstrated "the rapacity of the police and civil court underlings who were working in the interests of extortionate mahajans and of oppressive zamindars".[42]

This district was henceforth to be administered on non-regulation principles and was exempted from the operation of the general laws except in regard to civil suits above Rs. 1000 in value, the collection of revenue in permanently settled estates and the sale of lands for arrears of revenue. The Commissioner of the Bhagalpur Division was to exercise general powers of control and revision over the whole administration civil and criminal, and in revenue matters he was to take the place of the Board of Revenue. The district was to be administered by a Deputy Commissioner and some uncovenanted officers to be called Assistant Commissioners. In 1856, a few simple rules for civil and criminal administration were laid down. These rules in regard to criminal administration remained in operation till 1862, when the Penal Code was introduced. The Criminal Procedure Code was not formally extended, but the local officers were directed to act in

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[40] R. Carstairs, *The Little World of an Indian District Officer*, London, Macmillan & Co., 1912, p. 225.

[41] The District of the Santhal Parganas was predominantly inhabited by aboriginals of four tribes : (*i*) Santhals, (*ii*) Paharias, (*iii*) Bhuiyas, and (*iv*) Khetauries. The 1951 census records that the tribal population forms 44 per cent of the whole population of the district. The census further shows that the population of the aboriginals is on the decline.

[42] Bihar and Orissa, *First Decennial Review of the Administration and Development of the Province*, 1912-22, Patna, Superintendent, Government Printing, 1923, p. 63.

accordance with its spirit. A simple code of civil rules was introduced in 1858 and subsequently revised in 1863.

From 1855 onwards, the Santhal Parganas was a 'division' consisting of our districts—Dumka, Godda, Rajmahal and Deoghar. The four officers in charge, the Deputy and three Assistant Commissioners, were all directly under the Commissioner, though the first exercised some supervision over the other three. Each of the four had a second officer to help him; and the eight constituted the 'Santhal Commission'. These eight *hakims* were appointed to be the sole representatives of the Government among the people. The author of this new system was the Commissioner, George Yule, after whom the system came to be known. Under this system, justice was informal. "There was no distinction between civil and criminal courts, no government police, no lawyers, clerks, or process-servers, no fees. In his court room or on the road side under a tree, the *Hakim* received the complaint made verbally, sent the plaintiff to fetch the defendant and there and then they had it out. The head man of each village—Manjhi, as the Santhal called him, was its police officer. He represented the people, as the *Hakim* did the Government, and between him and the *Hakim* the whole work of the administration was expected to be done. The great object of the system was to keep touch, and this was ensured by having no intermediary between the *Hakim* and his people."[43] Here was an exact replica of the non-regulation system of the Punjab.

The administration of the Santhal system, from the side of the people, was based upon the village community and the *pradhani* system. The rights of the village land vested primarily in the village community, and its rights prevailed over those of the individual. The record of rights contained a code for the internal self-government of the village in matters of tenancy rights and duties. Where the *pradhani* system existed the internal government of the village in such matters was vested in the *pradhan* who was responsible to the landlord for the payment of rents of the village, and to the village community and to the Deputy Commissioner and his sub-divisional officers for the maintenance and observance of the village rights. The *pradhan* was made the representative of the people in their dealings with the landlord on the one hand and with Government on the other. The Santhal Parganas Enquiry Committee has characterised the *pradhani* system thus:

> "On the one hand, it excludes the landlord from the village except in certain very restricted matters and thus protects the raiyats from the harassment and oppression of Zamindari Amala. On

[43] R. Carstairs, *op. cit.*, p. 228.

the other hand, it preserves the community spirit and independence of the village community to an extent which is rare in the rest of the province, while the provision throughout the record of rights for direct access to the *Hakim* in matter of dispute is designed to maintain that contact between the Government and people which is so necessary to good administration"[44]

This system of paternal rule in a tribal district tended to be, with the passage of time and by the end of the Second World War, a faint shadow of its original self, since the administration of the district failed to live up to its own traditions and the principles laid down for it. The development of a more democratic form of provincial Government increased and complicated work in the district considerably. Both the Deputy Commissioner and his sub-divisional officers had to spend far more time than formerly in reports and correspondence and in office work generally. The increasing volume of legislation multiplied the subjects with which local officers had to deal and amount of civil litigation tended to grow. This was particularly so in the case of suits valued above Rs. 1000 which occupied an undue proportion of the time of both Deputy Commissioner and of several of the Sub-divisional Officers. As a result, these officers were more and more tied down to headquarters and could devote less and less time to direct contact with the people and the settlement of their disputes and problems than was formerly possible. Not only was the control over the work of the courts less effective, but officers were in many instances out of touch with the people and their troubles. In fact, the influence of the ideology of paternalism was on the wane and the administration tended to sink into routine grooves and to work by rule.[45]

There was another factor which contributed considerably to this unfortunate result and that was the lack of continuity in the administration. Up to the last years of the twenties, the officers were sent to the district for long periods of time; it was usual to find officers stationed in it for ten years or more at a stretch and many of them spent almost their whole service there. These officers obtained a thorough knowledge of the language and of the people; they were known throughout the district and they inspired confidence. The efficiency of the system depended in a tribal district of personal rule on such continuity and confidence. But with the beginning of the 'thirties, owing to the pressure of other demands this policy tended to fall somewhat into abeyance

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[44] *Report of the Santhal Parganas Enquiry Committee,* Patna, Superintendent, Government Printing, 1938, para 16.

[45] Much of the data on the administration of the Santhal Parganas was collected at the office of the Divisional Commissioner, Bhagalpur, from unpublished government records and reports of Commissioners.

and officers were freely transferred to and from the district at short intervals. The result of frequent transfers was that some of the principles of the Santhal system tended to be forgotten or ignored, and these officers became more and more ignorant of well established rules and instructions which had formerly guided the Santhal courts. Much of the supervision of the Deputy Commissioner came to be exercised more through notes of instruction and circular orders than by personal contact and supervision.[16]

To re-establish more direct contact between the local officers and the people and to recapture even faintly the spirit of the fast vanishing non-regulation system, two things seemed to be called for: (*a*) the senior officers, the Deputy Commissioner and the Sub-divisional Officers should be relieved of a portion of their court work sufficient enough to enable them to devote more time to touring and to the direct disposal of revenue cases; and (*b*) officers should be kept in the district for much longer periods. Accordingly, the Santhal Parganas Enquiry Committee recommended in 1938:

"(1) That the Deputy Commissioner should be posted to the district for a period of not less than four years and, if possible, longer. Where possible, he should be given some experience of the district as a Sub-divisional Officer before he becomes Deputy Commissioner. Since the charge is an abnormally heavy one and makes great demands upon the energy and activity of the officers who hold it, young officers rather than officers who are approaching retirement should be appointed to it.

(2) Sub-divisional Officers, Deputy Collectors and Sub-deputy Collectors when sent to the district should be sent definitely for a period of not less than five years . . . the Sub-divisional Officers should ordinarily be selected from Deputy Collectors already serving in the district or in Chotanagpur.

(3) All officers posted to the district should be obliged to pass an examination in the Santhali language within two years on penalty of stoppage of further increments . . . a special allowance should be paid to all Deputy Collectors and Sub-Deputy Collectors serving in the district who have passed in the language . . . ."[47]

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[46] Unpublished reports of the Commissioners, Bhagalpur, on the administration of the Santhal Parganas.

[47] *Report of the Santhal Parganas Enquiry Committee*, 1938, *op. cit.*, para 22.

ADMINISTRATION OF CIVIL AND CRIMINAL COURTS

A distinct feature of the Santhal system was a special divided criminal jurisdiction in the district. The jurisdiction of the High Court at Patna extended only to sessions cases, cases involving Europeans and appeals by the Government against acquittals. The Commissioner of Bhagalpur was the High Court for all other courts and the course of appeal lay through the Deputy Commissioner, not through the Sessions Judge. This special criminal jurisdiction was established for various reasons: 'partly as an element in the scheme of co-ordinating all branches of administration under one head; partly because in the early days it was necessary to simplify the course of justice and do away as far as possible with technicalities; partly because the investigation of crime over a large area of the district was and still is performed by an untrained indigenous agency; partly to safeguard the integrity of the special laws of the district and to prevent differences of interpretation between Santhal civil and revenue courts on the one hand and the High Court on the other'.[48] This unification of control of all courts under one head was an important factor in securing stability of the local law and continuity of interpretation. For the special laws of the Santhal parganas were far from fully codified and were often imperfectly drafted. There was also a body of customary law, and of revenue and civil case law which had not been reduced to statutory form. It was contained in the rulings of revenue and civil courts of the Commissioner and Deputy Commissioner which had never been collected and published and had undergone development as times and circumstances changed. Many criminal cases, particularly those which arose out of agricultural disputes, contained elements which concerned the civil or revenue laws and a criminal court trying such cases had to decide points which required special local knowledge not contained in the general law of the land. To much of this law the judge at Bhagalpur and the High Court had no easy access, and it was for these reasons, among others, that the special arrangements governing the criminal courts were sought to be retained.

The continuance of this system was, however, indefensible and the fact that the law was imperfectly codified was not a valid reason for retaining it The aforesaid difficulties no doubt existed, but they would have been greatly reduced if the tenancy law was codified in a complete form. This did involve the risk of excessive rigidity, but it was worth facing. There was already mounting demand from more advanced sections of the population that all criminal courts should be under the High Court. The High Court was rightly regarded throughout

[48] Santhal Committee Report, *op. cit.*, para. 28.

the country as the palladium of people's rights, and the control of criminal courts by executive authorities was distrusted in many quarters. There was a feeling that criminal justice might be coloured by executive considerations and the power of the Deputy Commissioner to enhance sentences on appeal, a power which elsewhere was not vested in any authority lower than the High Court, called forth special criticism. The separation of the judicial from the executive functions was a plank in the programme of all progressive parties in India during the British rule.[49]

Another feature of the Santhal System was the existence of two sets of civil courts in the district—the regular civil courts which dealt with suits valued above Rs. 1,000 and the Santhal civil courts which dealt with all civil suits up to a value of Rs. 1,000. The former courts were under the jurisdiction of the High Court at Patna and were governed by the Civil Procedure Code. The suits were tried by the Subdivisional Officers or by Deputy Collectors especially empowered, who were vested with the powers of a Subordinate Judge. The Deputy Commissioner was the District Judge. This arrangement which was part of the System of concentrating all courts under the Deputy Commissioner was reminiscent of paternalist rule. The reasons for this were stated to be that cases involving points of 'special' local law occurred which it was desirable that the Deputy Commissioner alone should handle. So far as Santhal civil courts were concerned, money suits of every description, and rent suits against raiyats only, up to a value of Rs. 200 might be tried by Sub-Deputy Collectors, suits of any kind up to a value of Rs. 500 by Deputy Collectors and suits valued above Rs. 500 were triable only by the Sub-divisional Officers. Appeals from suits tried by Deputy Collectors and Sub-Deputy Collectors lay in the first instance to the Sub-divisional Officer. The course of appeal was to the Deputy Commissioner and the Commissioner. The High Court of Patna had no jurisdiction and for these suits the Commissioner of Bhagalpur was the High Court.

The existence of two sets of civil courts, one under the High court at Patna and the other under the Commissioner, Bhagalpur, and still more the exercise of civil jurisdiction by officers other than those of the judicial cadre was often attacked. The general criticisms made on the Santhal civil courts was that the officers lacked training in civil law which was necessary to enable them to decide cases correctly,

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[49] For a general discussion on the problem of separating judicial and executive functions in the district of Bihar. see Haridwar Rai, "The Separation of Judicial and Executive Functions of the District Magistrate: An Aspect of the Criminal Administration in a District of Bihar", *Journal of the National Academy of Administration*, Mussoorie, Vol. XI, No. I, pp. 1-22, 1966.

that their decisions were often arbitrary and summary, and that the Santhal Civil Rules under which they worked were defective and inadequate. This led to injustice and Government had often been urged, therefore, to abolish these courts and to place all civil courts under the rule of the High Court and the Civil Procedure Code. The legal profession, in particular, was opposed to this system. It could, however, be argued that the existence of separate Santhal Civil Courts served a useful purpose as far as the simple tribal people were concerned. These courts with their simplified procedure possessed very definite advantages for the poor classes of litigants. Their working was based on the paternalist principle that the ordinary litigation of the cultivators and of the poorer classes which formed the vast bulk of the litigation coming before the courts should be tried in the simplest, cheapest and the most expeditious manner and as far as possible by direct dealing between the parties and the court.

THE PARGANAIT SYSTEM

It was an important object of the Santhal system, like other non-regulation systems, to maintain intact indigenous institutions of the district. Among these the *Parganait* Damin-i-koh area of the district played and still play a very important part.[50] They were originally the tribal leaders of the Santhal settlers and have continued ever since to hold their position as heads of the community. They appear to have been recognised at an early date as fiscal heads of local areas. With the establishment of the Santhal system, they were recognised by Government and came to occupy a mixed position; partly as leaders of the Santhal community vested with social and tribal functions and powers to decide disputes both civil and criminal, partly as fiscal heads of the area who were responsible for looking after the collection of the revenue and settling down disputes, partly as police officials responsible to Government for maintaining law and order and for the reporting and investigation of crime.[51] The *Parganait* came to be the main channel of communication between the village community and the *hakim*. The system was well suited for the requirements of the area of the district where the vast majority of the population consisted and still consists of people living in the primitive conditions. The Santhals are much attached to it and in time of trouble the *Parganaits* were the people to whom they turned for guidance and leadership.

The *Parganait* system, however, tended to degenerate partly due to excessive adherence to the hereditary principle of appointment.

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[50] Damin-i-koh is a persian expression meaning 'Skirts of the hill'. It covers Rajmahal, Dumka, Pakur and Godda Sub-divisions of the district of the Santhal Parganas.

[51] See *Report of the Santhal Parganas Enquiry Committee, op. cit.*, para. 117.

In theory, the appointment of a *Parganait* rested in the hands of the Sub-divisional Officer and the Deputy Commissioner and the rules required that in making the appointment the wishes of the community should be ascertained. But the office was hereditary in origin and the rules prescribed that, if possible, the son should be appointed to succeed his father except in the case of *Parganait* dismissed for misconduct. In practice, the son or the nearest relative of the last *Parganait* was almost invariably appointed and the authorities found it difficult to get rid of incompetent *Parganaits*, because the rules provided for dismissal only for misconduct and not for incompetence. Strict adherence to the hereditary principle was largely due to a reluctance on the part of the officials to interfere with old customs or to do anything which might impair the *Parganait's* position in the community. The best way to arrest further degeneration of the system could have been to make appointment by the combination of election and selection, prescribe a fixed tenure of office and make him eligible for reappointment.

Conclusion

The non-regulation system of field administration was a half-way house between despotic personal rule and the Government by impersonal rule of law. Initially devised as a political instrument to keep under imperial control newly annexed tracts of country inhabited by wild or semi-civilised people and formulated as an ideology to justify this control, the non-regulation system aimed to retain as far as expedient the indigenous institutions intact. A conservative and pragmatic force was against the spirit of innovation and *anglicization*. It believed that the best form of Government, in the interest of a 'backward' people, was that which was 'most simple and most free' from artificial and exotic influences.

The pattern of administration of a non-regulation area was unitary and military in form, the non-regulation official being a paternalist of the benevolent type. The Deputy Commissioner was the fulcrum of the system, and his duties and powers were conceived in terms of what the British paternalists imagined was 'Oriental despotism'. He was to embody and perpetuate in his person the 'Indian tradition of personal government' and provide a focus for the instincts of loyalty. He was to be a kindly autocrat living among the people, acting from personal observation and experience, linked into a personal chain of command and freed from the fetters of judicial constraints.

Non-regulation men looked upon the regulation system as 'a system of abstract principle' inapplicable to India, as an 'impersonal

bureaucracy' instead of a personal, human and tangible form of government. The non-regulation system of administration was to be conducted from the tent and the saddle rather than from the office. It was to be an 'intelligible' form of government and law, to be closest to the life of the people and sympathetic to their conservative urges. It was intended to be free from Cornwallis' notion of limited government and to constantly emphasise that everything depended upon a vigorous and paternal executive.

The essential features of field administration of the non-regulation system whether of the Punjab or the Santhal variety were the control of all departments of the administration by one officer, the Deputy Commissioner, and the maintenance of direct personal contact between him and his subordinates, the Sub-divisional Officers, on the one hand and the villagers on the other. For this reason, all courts, revenue, criminal and civil, were placed under the control of the Deputy Commissioner with appellate and supervising powers vested in the Commissioner. The civil courts were removed from the jurisdiction of the High Court, except for the trial of sessions cases involving Europeans and the hearing of appeals against acquittals. To ensure direct contact between the *hakim* and the people, the employment of legal practitioners was somewhat restricted and all the courts were directed to hear cases as far as possible without such intervention.

The non-regulation system of field administration thrived under special conditions and there was little doubt that, if continued beyond a certain period of time, it tended to become a clog upon the efficient working of administrative machine. After the first flush was over, there was danger of the non-regulation area adopting formalistic judicial procedure and routinised administrative practices which marked the non-regulation provinces, the influence of ideology fading out and the routine asserting itself over the minds of officials. Initial administrative measures initiated by the British administrators left lasting impressions on the newly acquired area since it had little familiarity with a well-organised administration in pre-British times.

AN EXCURSION IN OLYMPIAN DETACHMENT

*O. Glenn Stahl**

BRASH Americans are sometimes known to step into areas "where even angels fear to tread". This can be given a favourable connotation when speaking of astronauts walking on the moon, or a negative one when referring to visitors asserting themselves in the midst of a lively local debate. In either case, the territory traversed is strange to the interloper and the treading itself fraught with hazard.

It is under such circumstances that I find myself—perhaps foolishly—accepting the invitation to set forth this critique of two pieces that appeared in this Journal (Jan.-Mar. 1969) concerning the recent Administrative Reforms Commission Report on *Personnel Administration.* I refer to "Personnel Administration—The Need for Realism" by M. K. Chaturvedi and "Personnel Administration—a Muffled Cry for Change by the Administrative Reforms Commission" by K. N. Butani. This, then, is a critique of two critiques, where the only advantage is that of having the last word, although even that is none too certain.

The two gentlemen began their titles with the same words, but from there on the deviation between them in word, evidence, and opinion is rather marked. It is not my purpose to arrive at some sweeping conclusion as to who won the debate. The better part of diplomacy would suggest that I keep my own counsel on any such grand summing up.

But I hope I will not be overstepping the bounds of propriety (or betraying my own ignorance!) to try to be analytical about the insights and observations the two authors brought out, to indicate some appraisal of specific points here and there, to raise some questions, and perhaps, where I have the competence, to indulge a viewpoint of my own on an issue or two.

At the outset, let me seize this opportunity to express two very firm convictions for which I make no apology and brook no hope for retreat.

*Although the Ford Foundation, at the request of the Indian Institute of Public Administration, made the services of Dr. Stahl available to the institute, the views expressed by him in this article are entirely his own.

One is my judgment that these two writers, Mr. Butani and Mr. Chaturvedi, are clearly able and high-principled men, gifted in scholarly analysis and in the use of language; and the other is this: particularly from the vantage point of an outsider, I am troubled—indeed I consider it most regrettable—that so much of the discussion (reflected in these two articles and elsewhere) revolves around the merits of the Indian Administrative Service and of its membership. To me, this issue as to the qualities or deficiencies of the IAS is quite beside the point.

The blame for this polarization on the IAS *per se* cannot be placed so much on the two distinguished pamphleteers who saw the ARC Report through two different microscopes but on some elements of the ARC Report itself and on its timing. Conscious of the prototypes of the British Civil Service and of the bristling Fulton report in the United Kingdom which, in its effort to generate a climate for change, appeared to condemn the British Administrative Class and the virtues of general administrators, Indian officials and scholars perhaps are over-ready for an "issue". Nevertheless, the ARC Report itself may have devoted too much rhetoric to the cause of specialisation, thus appearing to deplore the capacity of the IAS (although I don't think this was its intention). And one or two of the Commission members in their supplementary notes or dissents themselves seemed to generate part of the debate by assuming that the Report to which they had given "general assent" had borne down too hard on the need for quite specific (and allegedly very limited) functional specialities by IAS officers, to which they took some exception and to which some IAS officers understandably took umbrage. Actually, a careful reading of the "notes and dissents" suggests far more unanimity among the members on major points than disagreement, and the relative minor differences are in emphasis or implication.

In my judgment the issue should not be that of "generalist versus specialist" (as Mr. Chaturvedi correctly observes), nor the merits of an all-India oriented service as such (as correctly implied by Mr. Butani), nor the capacity or promotability of IAS officers—the issue which I fear both seem to accept. The central problem appears to me to be one of organization of ministries and the uses of a personnel system to support such organization. Neither Mr. Butani nor Mr. Chaturvedi seem to take this into account.

What I mean may be clearer after a little further analysis of the two critiques themselves. First, let us look at the flaws they find in the ARC Report. Although I should like to see more credit given to the ARC for a truly masterful effort on a very intricate subject and for

the surprising degree of cohesion achieved in the face of conflicting testimony, evidence, and opinion, I am also impressed with the shortcomings of the Report delineated by the two ciritics, particularly

(1) Its over-conciseness on some critical points, leaving uncertainty about its intent (Butani).

(2) The inadequacy or confusion in the proposed number and definition of specializations at the middle management level (Butani and Chaturvedi).

(3) Failure to deal with "the falling attractiveness of public employment" (Chaturvedi).

(4) Failure to deal with "the problem of administrative apoplexy at the Centre and anemia at the extremities", including especially the diminishing attractiveness of field jobs (Chaturvedi).

An objective observer would find it difficult to deny these deficiencies—but none of them (nor others set forth which I do not consider as significant) mitigate the need to look at the issue of access to top policy posts and how these are organized.

The nub of the difference between our two analysts is perhaps best exemplified in these two statements:

(1) Mr. Chaturvedi says: "The Indian Administrative Service should be recognised and groomed to be the sole corps of professional administrators to man all the Secretariat posts at the Union and the State headquarters at and above the level of Deputy Secretaries."(p. 67).

(2) Mr. Butani concurs in the following, his description of the Report's general thrust: "No particular cadre will, *ab initio*, be constituted on the assumption that it alone will provide personnel for the top administration policy positions on the basis of a superiority established at an academic examination at the entry point in service."(p.16).

Mr. Chaturvedi's most telling argument, in my judgment, is the need to provide some assured reward as an incentive for accepting tough and burdensome field assignments as District Collectors. He moderates his proposal for reserving Joint Secretary and higher posts to the IAS by suggesting a means for switchovers from other "uni-functional" services at mid-career, which would require decisions by individuals by age 35 and competition through an examination patterned after

Method II used in entry to the British Administrative Class (p. 68). His assumptions (on p. 67) of need to remedy recruiting standards to the IAS, to recognise comparable talent in other sectors of public employment, to provide for greater specialization of the IAS into broad areas, and to institute position classification to identify job needs, seem unexceptionable to me (and remarkably close to the stated objectives of the ARC!).

Mr. Butani's most effective retort, it seems to me, lies in his rhetorical question: "Why must one proceed on the assumption of an *ab initio* pre-eminence of one cadre—the most generalist of them all—and then proceed to consider how best it could be re-organized to make for the specialization that is called for in modern government? The question that should really concern one most is not how best to reorganize one particular service or to convert the generalists into specialists but how to get the best from all sources and how to convert the specialists—with whom we have inevitably to live—into generalists, progressively, as they move up the hierarchical ladder." (p. 21). The reasonableness and common sense of this statement I also find eminently appealing and persuasive.

Why, then, must it be concluded that Chaturvedi and Butani are so far apart? Or, could it be that they are both right, and that the problem has been too narrowly put—forcing protagonists into the side-issue of arguing over how well-equipped the IAS—in comparison with specialists, or uni-functionalists, or whatever—is now, or can be in the future, for top positions in the Central Secretariat? What is it that makes the prize so valued? And why is it that the specialized Services are not and are not going to be satisfied with mere equal pay or even equal rank, thus leading to unhealthy animosity against the IAS and equally unhealthy defensiveness on its part?

Here is where I come to the central deficiency as an outsider sees it, one which neither Butani nor Chaturvedi mentions. I refer to the structure of central ministries that establishes an insulating pyramidal layer of permanent civil servants between political ministers and the operating departments or other entities making up their domain. I fear there will always be conflict over "who has the right" among non-elected career professionals to such a concentration of policy power in the permanent government service.

At the risk of alienating everyone, I ask: what is so sacrosanct about maintaining a single career civil servant, a secretary, with a coterie of joint secretaries and others—from whatever source they

come—as a heavy-webbed filter through which, and *only* through which, all the business of a ministry must be transacted? Is it inconceivable that the parliamentary system might survive with specialized department heads reporting directly to a minister? Or, to put it in another way, is it inconceivable that there might usefully be several secretaries, depending on the number of major functions under the ministry and including one concerned with non-technical administrative matters?

This is revolutionary thought admittedly, and perhaps foolhardy and anathema to boot. But six years after India's independence Paul H. Appleby in his well-known report on *Public Administration in India* came close to questioning this organization in all respects but form. For example, in addition to his praise of the ICS and the IAS which Chaturvedi cites but which I take to be his explanation for why he felt that much was achieved in spite of the organizational structure, Appleby alleged (italics supplied):

> "The structure within ministries is *ill-designed for delegation*, and there is, in fact, much more unconscious than conscious delegation.... Imperfect and insufficient conscious delegation is an important factor in making the heavy overload that grievously burdens ministers and secretaries. *Group judgment*, which is and should be an outstanding characteristic of administration, *is more often interministerial and dependent upon successive conferences between peers than achieved between levels of integrated hierarchies in well filled-in pyramids.*
>
> "The conventions of personnel arrangements augment all of these difficulties."[1]

Whether this allegation would still apply today can best be determined by impartial Indian observers, but it does seem to me that the current structure of ministries, most with a minister, a deputy minister or minister of state, and a secretary, reflect a very narrow and steep apex and hardly a "well filled-in pyramid".

In addition, Appleby asserted quite emphatically:

> "There are too many forms of class, rank and prerogative consciousness, too much insistence on too-uniform concentration of communication in formal channels . . . " etc.[2]

[1] Paul H. Appleby, *Public Administration in India: Report of a Survey*, New Delhi, Government of India, Cabinet Secretariat, 1953, p. 23.

[2] *Ibid*,

In his discussion of development problems, he brought out the organizational implications of the specialist *vs.* non-specialist issue as follows:

> "The states and special dam and industrial projects have utilized engineers in quality and number not often available at the Centre, and everywhere I found intense resentment over petty efforts to challenge such technical findings in letters clearly written by subordinate personnel without technical qualifications. This resentment of the layman is a common and natural phenomenon, and usually lamentably unmindful of the valid non-technical considerations that enter into public business at higher levels. But the point is that in the cases brought to my attention the review was not pitched in those valid, higher-level terms. The zeal for action was being damped down not only by an extraordinarily complex arrangement of responsibilities, but by a lack of understanding differentiating those responsibilities."[3]

Taking note of the traditional effort "in all governments" to keep politics "out of the civil service and out of 'administration' ", Appleby observed further that

> ". . . the invocation of 'political neutrality' on the part of civil servants—central to the original reform insofar as the partisan political is concerned—tended to be made to appear to extend to 'programme neutrality'.
>
> The inference sometimes is that an administrator will do as well in carrying on a programme he is not much interested in as he will in handling one about which he is especially enthusiastic. The inclination was to a belief that 'administration' is mechanical, merely technical, unvarying.
>
> If it be said that administration is only a 'means', let it also be said, as Gandhi here and Emerson in America among others have pointed out, that 'the end pre-exists in the means'. Until recognition of this is behind the selection and direction of public personnel, public personnel administration cannot be regarded as really mature."[4]

This seems to be, in essence, what the Administrative Reforms Commission in 1969 is saying in urging more programme experience and commitment on the part of senior career administrators. On this point, I would gather that both Chaturvedi and Butani agree.

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[3] Paul H. Appleby, *op. cit.*, p. 44.

[4] *Ibid.*, p. 25.

In effect, then, I must admit to considerable doubt whether there can be a settled issue on the proper role and organization of the IAS and of technical services without facing up to the proper role and organization of the entire structure under a political minister. Here lie some pregnant possibilities for reform that have great bearing on the viability and responsiveness of administration in a democracy.

Nevertheless, I cannot close without correcting two points on which I feel I can speak authoritatively. Mr. Chaturvedi cites both Paul Appleby and the Hoover Commission in the United States in such a way as to imply support for an elite administrative group from which senior appointments may be exclusively made. Any such inference drawn by the reader from these citations would be in error.

First, as to Appleby, I know personally his long time aversion to the formalities of special corps systems but, more important, must call attention to the following paragraph from this same, previously cited study of Indian administration:

> "I would suggest here, for example, for the purpose of a fresh look, abandoning the very idea of 'cadres', 'officers', 'clerks', 'ministry' or 'secretariat' as distinct from 'establishment', 'Class I, II, III, and IV', the word 'class' altogether, 'gazetted', 'temporaries', each named special service, etc. I would hope similarly that there be temporarily expunged from the mind any old conceptions about numbers in any given rank, class or annual increment, about number of years prerequisite to promotion or after which promotion should be thought mandatory. . . . " etc.[5]

In another place, Appleby notes:

> "Excessive emphasis on departmentalization of competence and activity seemed to me not unrelated to an extreme intraorganisational emphasis on rank, with considerable awe for 'officials'."[6]

And, again:

> "Fixed, small limitations in these special services and cadres are, in my opinion, the basic deterrent to rapid improvement of the administrative grasp of governmental responsibilities. For all the fine and able men in key places, they are not nearly numerous enough, they are individually of too crucial importance; they have much too inadequate underpinning; they are too much apart, too

[5] Paul H. Appleby, *op. cit.*, p. 27.

[6] *Ibid.*, p. 48.

much a kind of special species. How it can be hoped to make much administrative advance without adding many able persons just as soon as possible, I cannot see. The personnel citadels cannot insure these additions, but they have an important part to play in making them possible."[7]

Chaturvedi also cites the Personnel Task Force Report of the second Hoover Commission (1955) in the United States as evidence that "the value of the elite concept has been felt" even there. (p. 39).

This is a very mistaken interpretation, and from my detailed knowledge of that Report and close acquaintance with the man who wrote it, I am compelled to correct it.

Neither the Task Force nor the Hoover Commission itself proposed an elite group. They did propose a "Senior Civil Service"—a horizontal band of the top career jobs in the government at the three highest grades, both administrative and specialized—which would have special emoluments and recognition, the members of which would retain their grades (or rank) regardless of assignment, would be given special training opportunities, would have greater incentive for mobility, and would be retained on the payroll even when a current assignment is eliminated. Everyone of these goals has since been largely realized (except the complete reduction of vulnerability to separation when programmes decline or change) through the U.S. Government's Executive Assignment Programme, its Executive Institute at Charlottesville, expanded executive mobility, and much improved salaries at upper levels in relation to the private sector.

But the important point is that membership in the so-called Senior Civil Service, both as envisaged by the Hoover Commission and its Task Force and in current practice, is acquired by *promotion from any sector or specialization within the civil service, regardless of mode of entry or category or designation.* This "upper crust" of the service includes scientists, doctors, engineers, accountants, economists, budget planners, personnel specialists, and hosts of others, as well as a variety of generalist-type executives. There is no "elite" group, nor has such ever been proposed, that by virtue of initial entry or as the result even of mid-career selection has exclusive access to the top-most grades.

But what is done in the United States, or the United Kingdom (where implementation of the Fulton Committee recommendations could produce marked changes), or anywhere else, is not the issue.

[7] Paul H. Appleby, *op. cit.*, p. 28.

We are concerned here with India. It can profit from the experience of the other great democracies, but it must build on what it has started. And, in this respect, my opinion is that the Administrative Reforms Commission has made a significant contribution in urging a design that is at once indigenous and responsive to the needs of the times.

But neither the ARC's nor Mr. Butani's, nor Mr. Chaturvedi's, nor my comments should be taken in derogation of institutions, groups, or persons. I feel much like my over-quoted predecessor, Mr. Appleby, who said:

> "It remains to be said that I am quite well aware of the fact that the Government of India works much better in its own terms than these compressed criticisms would seem to imply. When one loses eyesight, ears become more than normally acute and useful. In some organic maladjustment, glands are likely to make compensatory changes."[8]

Perhaps all can agree that any repair or replacement of organs will relieve the pressure for glandular compensation but that such repair or replacement must be tested, and careful, and sure.

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[8] Paul H. Appleby, *op. cit.*, p. 24.

DEVELOPING ADMINISTRATORS FOR TOMORROW

Kamla Chowdhry

BEFORE Independence, the administrators were trained to maintain law and order, and to 'govern' a community which was largely rural and agricultural. As one of them so aptly stated, "We were the 'ma-bap' of the districts we administered". With Independence, however, the Government acquired a new look. Administrators who had been developed to play the "ma-bap" role were now required to understand and effectively deal with the many new tasks undertaken by the Government. The "green revolution" required administrators who could effectively combine in policy and programmes, an understanding of science and technology of agriculture, of mass and other new communication media, of economics and budgets, and of change agents and change programmes. Similarly, when the Government undertook to build and manage large steel, fertilizer, and other industrial projects, it required administrators who had the skills of the entrepreneur and of the business manager. Not only in agriculture and industry but in dealing with public health, population control, education, etc., the administrator required a much greater understanding of the nature of science and technology on the one hand, and of the forces and skills required for effecting social and economic change on the other hand.

Jawaharlal Nehru had often expressed this commitment to science and technology, firmly believing that without science and technology progress was impossible. "After all how has agriculture grown in many other countries? It is because of the application of science and technology. If modern life depends so much on science and technology, then we must seize hold of them, understand them and apply them."[1]

If the country was to move towards an economy based on science and technology, then it was necessary that such administrative practices be evolved that were suitable for the growth of these new programmes and projects. The 'green revolution' and the 'industrial revolution' also required an 'administrative revolution' and this could only be accomplished by administrators who understood scientists

[1] Homi J. Bhabha, *Science and Problems of Development*, Bombay, Hind Kitab Press, 1966.

and technologists, who had a deep familiarity with the phenomena these scientists and technologists dealt with, and who were sensitive and responsive to the dynamics of change.

One of the difficult aspects of building new institutions and new programmes is the establishment of an administrative culture suitable to the new tasks. In the many new scientific institutions that Dr. Bhabha[2] and Dr. Sarabhai[3] brought into existence, the strategy was to let the scientists and technologists themselves evolve administrative practices suitable for their effective functioning. Once the appropriate administrative machinery and practices were established, 'non-scientific' administrators were able to maintain a suitable 'culture'. By 'culture' I mean ways of thinking and doing things within a given setting. Thus, when Bhabha Atomic Research Centre was started, administrative officers developed in the culture of the Tata Institute of Fundamental Research were transferred to it along with a group of scientists. In Ahmedabad Textile Industry's Research Association, a suitable administrative officer was only found seven years after the institution had started functioning. During these seven years 'administration' was handled by the scientists and technologists themselves. On the other hand, many of the scientific laboratories that the Council of Scientific and Industrial Research built took a different road. From the start they borrowed administrators and administrative practices from government. The result was that administrative practices were introduced which were dysfunctional to the growth and effective functioning of these new institutions.

The point which needs to be stressed is that if the country is to undertake and manage projects, programmes, and people dealing with science and technology then it is essential that the administrators of tomorrow should have a feel and a familiarity for science and technology. It is not suggested that all administrators be scientists and technologists, but a sufficient familiarity with the scientific method should indeed be considered to be essential. In the 'age of science', an educated administrator must have enough scientific literacy to be able to communicate with relevant scientists and technologists and to make decisions with sufficient confidence concerning the new projects and programmes. New administrative practices are not likely to develop merely with the bringing in of specialists, who are either

[2] Kamla Chowdhry and Vikram A. Sarabhai, "Organization for Developmental Tasks: Atomic Energy Commission of India", *Indian Journal of Public Administration*, Vol. XIV, No. 1. (Jan.-March), 1968.

[3] Kamla Chowdhry, "Institution Building and Social Change: Ahmedabad Textile Industry's Research Association", *Indian Journal of Public Administration*, Vol. XIV, No. 4. (Oct.-Dec.), 1968.

subordinate to the generalist administrator or who work parallel to him in the organisation hierarchy. A whole new generation of administrators will have to evolve new administrative practices based on a genuine familiarity with, and a knowledge of technological and social sciences.

HOW MUCH OF SCIENCE AND TECHNOLOGY FOR ADMINISTRATORS?

How much knowledge of science and technology should an administrator have to provide him with this necessary familiarity? I do not have a curriculum to suggest but I do believe a group of scientists-turned-administrators, or a group of scientists and administrators who can communicate with each other should work out a curriculum for the non-scientist administrators.

Sir Eric Ashby[4] in his paper the *Administrator: Bottleneck or Pump?* suggests the following ways of organising a course for the future administrators.

> "Suppose one were to bring a group of young scientists and young would-be administrators together and ask them to tackle an exercise in administration involving science. . . . The course should be organised as a series of seminars. To descend to details about such a course is to expose oneself to criticism, but since it is the purpose of this paper to provoke discussion, I end with the skeleton of a syllabus written in the context of British science:
>
> (1) The organisation of science and the ways in which scientific research is administered and financed.
>
> (2) Two-way communication in science : between research workers; between scientists and technologists; between scientists and administrators; between scientists and the public; and the apparatus of criticism in science.
>
> (3) The bridges between scientific discoveries which have practical application and their successful exploitation.
>
> (4) Case studies on administration involving sciences. Under this head the seminar could study sets of documents of the sort which administrators have before them as the "raw material" for some major decisions involving science, *e.g.*, a memorandum from a faculty of science to be incorporated in a university's submission to the University Grants Commission for quinquennial grants; the data from which

[4] "Science and Technology in Contemporary Society", *Daedalus*, Spring 1962, p. 277.

> proposals are put up to the Treasury for quinquennial grant to cover the cost of post-graduate research studentships in Britain; memoranda from a road research station from which a brief would be prepared for a Minister on the need for expenditure on roads to reduce the accident rate.
>
> After a study of the documents, members of the seminar would discuss the decision which was in fact taken (and various alternatives to it) and prepare their own summaries of a decision and of some of the supporting documents.
>
> It is of course a very empirical and fragmentary way of study which I propose; but it is one which has a good deal of successful precedent in other fields."

What Sir Eric Ashby has suggested is first, a familiarity by the would-be administrator with young scientists and their point of view and frame of reference, and second, the use of the case method for improving administrative decisions in the territory of science and technology. A seminar course of 30 to 40 cases with an appropriate list of readings could be a good starting point.

EMPHASIS ON BEHAVIOURAL SCIENCES

Another important area that needs to be emphasised in the development of tomorrow's administrators is some knowledge of behavioural sciences. If the administrator of tomorrow is to be responsive to change and at the same time assume the rôle of a change agent, he will need knowledge about the dynamics of resistance and of management of change in individuals, groups and communities. The idea is not to train the administrator as a behavioural scientist but to give him a conceptual framework that would help him to observe, analyse and evaluate a given situation more effectively.

Just as a physician uses conceptual knowledge of anatomy, physiology, biology, etc., in diagnosing a patient, or in evaluating a public health hazard, the administrator applies knowledge of behavioural sciences to understand and deal with human problems. For the administrator, theories in behavioural sciences are meant as a basis for better observation, better evaluation and better decisions. Without a conceptual framework, observations are likely to be biased and irrelevant; biased because of the assumptions and beliefs that an individual brings to any given situation, and irrelevant because he has no way of discriminating meaningful from meaningless observations. An administrator will decide and act according to the way he evaluates

the situation he encounters. Some evaluations are more mature and discriminating than others and, therefore, lead to more effective action. Any fundamental change in decision and action must involve a fundamental change in perception of the inner and the outer world. This requires both an improved self-awareness and a better knowledge of behavioural sciences.

A few years ago I had the privilege of spending two days with the trainees of a Government Staff College. In an informal discussion with about 25 to 30 of the trainees I asked them as to why they had selected a career in Government. In the following two-hour discussion three recurring themes emerged: first, they believed that to find good jobs in business they required 'right connections' and 'right pulls' while they could enter a government job, through competition; second, they believed that business was corrupt and unacceptable demands would be made on their personal integrity; third, the Government jobs had enormous opportunities, challenges and involved exercise of power.

Such perceptions and generalisations of the would-be administrators is likely to play an important part in their subsequent policies and decisions. Unless these administrators acquire some self-awareness and understand the limits of their generalisations, their ability to interpret and learn from subsequent experience are liable to be seriously impaired.

The assumptions and attitudes that many of the trainees in this group expressed could certainly be traced to personal experiences or as part of the collective belief of certain social groups. The interesting thing about such beliefs is how personalised and how persistent they are. Furthermore, experience has a way of confirming such beliefs or "facts". For those of us who believe that jobs can only be obtained through 'right connections' experience proves it to be so since there are enough situations in which jobs have been obtained through such practices. There are also enough corrupt businessmen (as there are corrupt people in other occupations) to confirm one's belief that businessmen are corrupt. Once such beliefs are built they have a tendency to persist regardless of logic or evidence to the contrary. Leaving the young administrators to learn (or unlearn) from experience is, therefore, not as easy as it seems. Astonishingly enough, personal experience seems to teach different things to different people. It often teaches the 'wrong' as well as the 'right' lessons. Unless we learn (or are taught) to examine our attitudes and beliefs, we could easily end up with inadequate generalisations. Such generalisations limit the

administrators' ability to do a good job and prevent him from learning from experience. There is a very direct relationship between the awareness of one's own attitudes and beliefs with one's ability to evaluate and deal with situations.

DEVELOPING A CURRICULUM

The problem of developing administrators for the future is a formidable one. Unless we are fairly clear as to what we are after, the training programmes are not likely to be very useful. In the context of India's developmental needs and the fact that the Government is at the centre of most of these changes, it seems to me that the future administrator would need to acquire an understanding of:

(*i*) the nature of science and technology,

(*ii*) the nature of social systems and social change,

(*iii*) the nature and structure of Government, and

(*iv*) the nature of oneself and its relation to decision-making.

The usual tendency in working out a curriculum for general programmes is to give the trainees a little bit of the many subjects considered desirable and relevant. In one of the training programmes of the Central Government, in a programme of 4½ months, there were about 20 different subjects covered. In this connection, the two commandments enunciated by Whitehead[5] in his famous essay on *Aims of Education* published fifty years ago need to be kept in mind.

> "We enunciate two educational commandments—'do not teach too many subjects' and again 'what you teach teach thoroughly'.
>
> "The result of teaching small parts of a large number of subjects is the passive reception of disconnected ideas not illuminated with any spark of vitality. Let the main ideas which are introduced in the child's education be few and important and let them be thrown into every combination possible.
>
> "I can imagine a set of beings which might fortify their souls by passively reviewing disconnected ideas. Humanity is not built that way—except perhaps some editors of newspapers."

We might add that neither are good administrators built that way. The result of teaching small parts of a large number of subjects

[5] Whitehead, "Education in the Age of Science", *Daedalus*, Winter 1959, p. 193.

generally leads to disjointed ideas without any spark of vitality or creativity. The passive reception of a great many "inert ideas", as Whitehead points out, "is not only useless : it is above all things, harmful". By "inert ideas" he means "ideas that are merely received into the mind without being utilized, or tested or thrown into fresh combinations".

A curriculum which emphasises the multi-dimensional aspects of administrative problems and administrative decisions needs to be formulated. For instance, instead of teaching public administration as a combination of 29 separate items[6] and then leaving it to the trainee to integrate and apply this knowledge to real situations, there could be a course dealing with actual concrete problems of public administration. The relevant information and knowledge of the many disciplines and subjects can be provided as background reading material. The trainees in the discussion of the concrete, 'live' situations will utilize, test and throw the ideas into fresh and meaningful combinations. The emphasis in teaching should shift from the teachers imparting inert ideas to methods requiring discussion and self-learning.

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[6] Pamphlet issued by the National Academy of Administration, Mussoorie, 1968, p. 17.

BUREAUCRACY AND DEVELOPMENT —SOME REFLECTIONS

B. K. Dey

DEVELOPMENT Administration is one of those few sophisticated silhouettes of administrative concepts whose broad shadow outlines are widely recognized, though its inner details admit of no ready and precise identification. The outpouring of profuse writings on the subject has not been commensurate with the understanding in depth of all the ramifications of development as a dynamic process directed towards transforming the entire society, enmeshing together its socio-political and economic aspects, and the bureaucracy's role in regard to these major societal systemic changes. This article attempts to analyse the multi-dimensional characteristics of such a development-oriented administration and how they impinge on the structural and functional aspects of bureaucracy, as part of the same organism. Before we get bogged down to the dense smog of issues, which do not lend themselves to easy solutions, let us steer clear of some of the definitional difficulties.

Bureaucracy we may define as a systematic organization of tasks and individuals into a pattern which can most effectively achieve the ends of collective effort. It is a regulated administrative system organized as a series of interrelated offices.[1] Bureaucracy has certain structural features like rules, hierarchy, differentiation, etc., which display certain behavioural characteristics like objectivity, discretion and formalism for the achievement of certain determined goals.[2] From the structural aspect, it is obviously value neutral ("neither hero nor villain"); it can be treated as a phenomenon associated with any large-scale, complex organization. From the behavioural angle, bureaucracy may be thought of as showing some functional or pathological symptoms. From the achievemental or purposive point of view, it can be regarded as an "organisation that maximises efficiency in administration or an institutionalised method of organised social

[1] E. N. Gladden, *Essentials of Public Administration*, Staples Press Ltd. London, Third Edition, 1964.

[2] Ferrel Heady, *Public Administration : A Comparative Perspective*, Eaglewood Cliffs, NJ, Prentice Hall, ch. 2, 1966.

conduct in the interest of administrative efficiency".[3] This 'accordian-like conceptualisation' of bureaucracy or its afore-described three dimensional definition is useful for understanding its fundamental features and basic elements but it provides only an abstract, conceptual perspective. For establishing a positive correlation between bureaucracy and development, it is necessary to physically identify as to what 'bureaucracy' really denotes—who or what are they—rather than what, in abstraction, it connotes. Does it refer to all persons, at whatever level, who are on the public pay roll? Does it make much sense to cluster under the same generic category a postal peon and a high level policy maker, planner or a technocrat, a village level worker and a director of a ministry? Undeniably, for most people in most countries, government is scarcely more than the specific public officials with whom they have opportunity of need to come in direct contact. Thus, for rural people a village social worker or a B.D.O. may be a much more significant bureaucrat than the top level officers of the Ministry he represents. As La Palombara very succinctly puts, "the upper reaches of public administrative hierarchy may constitute a paragon of skill, rationality and humaneness, but all this will go relatively unnoticed, if those who deal directly with the public are arrogant, aloof, arbitrary and currupt in their behaviour. Those at the centre of administration may spin out beautiful and extremely insightful national plans, but these will appear not very meaningful—or even bizarre—to the population, if field administrators do not have the talent for translating what exists on paper to meet the requirements of human situations."[4] But there are certainly other occasions, like, formulation of public policy, where public servants at a relatively high level in the hierarchy constitute the relevant bureaucracy. By and large, for development administration, the bureaucrats of major interest are those who occupy managerial roles, who are in some directive capacity in either central agencies or in the field, who are concerned, in somewhat intimate or direct fashion, with the policy and plan formulation, programme implementation and evaluation, etc. The lower levels are of no consequence in such a developmental situation but, generally, those who are described in the language of public administration, 'middle' or 'top' management, *i.e.*, the effective managerial group, have mostly to bear the developmental brunt and their activities, behaviour and roles are likely to have more direct and decisive impact on different kinds of national development. This restrictive definition will be seen to have some operational significance.

[3] Peter Blau, *Bureaucracy in Modern Society*, New York, Random House, 1956.

[4] Joseph La Palombara (ed.), *Bureaucracy and Political Development*, Princeton, NJ, Princeton University, 1963.

Let us, now, bring our viewing lens closer on development administration, Edward Weidner, whose was the pioneering attempt to clarify some of the conceptual meanings of development administration, conceived it as "an action-oriented, goal-oriented administrative system".[5] In other words, it is concerned with achievement of definite programmatic goals; indeed, it is these programmatic values which go to transform the 'routine' administration into 'developmental'.

One could also view development administration as a carrier of innovating values—those connected with modernization and industrialization. Indeed, the functional dimension of such an administration often provides the 'differentia' — the administration for change will be known by wide and varied 'array of new functions assumed by developing countries embarking on the path of modernization and industrialization'.[6] This new activity charter, its significant kind and character impart a different meaning to the administration itself. It is, further, possible to envision development administration from the angle of bringing about a well-balanced and synchronised sectoral growth. So viewed development administration is "carrying out planned change in the economy (in agriculture or industry, or the capital infra-structure supporting either of these) and, to a lesser extent, in the social services of the state (especially education and public health). It is not usually associated with efforts to improve political capabilities"[7]. However, as discussed further below, at some earlier stages of development, engagement in at least quasi-political activities becomes development administrators' partial, often important, pre-occupation. It will be a truism to say that administration in developing countries is more politically or ideologically oriented and influenced to a great extent by a socio-political elite group than that in advanced countries where it is more functional and participative in nature.

The general consensus amongst scholars is that development is a total plan of action to bring about a directed or guided change in all aspects of social activity geared to national progress, with a heavy import of achievement of programmatic goals. Indeed, if development is defined, in short, as mobilization and direction of scarce resources for achieving constantly rising national objectives formulated

[5] Edward W. Weidner, *Development Administration : A new focus for Research*, in Ferrel Heady and Sybil L. Stokes (eds.), "Papers in Comparative Public Administration", Ann Arbor, Institute of Public Administration, University of Michigan, 1962.

[6] Merle Fainsod, *The Structure of Development Administration*, in Irving Swerdlow (ed.), *Development Administration : Concepts and Problems*, Syracuse, Syracuse University Press, 1963.

[7] John D. Montgomery, "A Royal Invitation : Variation on Three Classic Themes", in John D. Montgomery and William J. Siffin (eds.), *Approaches to Development : Politics, Administration and Change* .New York, McGraw-Hill Book Company, 1966.

by the national political machinery, development administration would imply that the administrative structure, procedures, staffing pattern, techniques of planning, personnel policies and practices and even relations with citizens, all should be attuned and harnessed to the goals and process of such national development.[8] In other words, it should have more managerial and programmatic overtone, apolitical so far as the resource planning and utilization is concerned but functioning within the frame of an ideological milieu.

Inevitability of State Positivism

The reasons for permeation of government into the deep soils of society or heavy public involvement in the phenomena of economic, social, and political change are as myriad as the kinds of development actually underway. In many places government is the only significant social sector willing to assume the responsibility for transformation. In others, the bureaucracy husbands the vast majority of whatever necessary professional, technical, entrepreneurial resources that may be available to a society committed to change. In still other areas, the primary—even monopolistic—involvement of public sector in programmes of social and economic developments may be a manifestation of fierce ideological commitment.[9] When our focus shifts from economic to other areas of activity like eradication of illiteracy, revitalisation of village-level governments, removal of ancient social barriers, etc., the presence of government is revealed in even sharper relief. In making a society "modern"[10] in the totality of this term, state must be accepted as "regulator", as mediator, as underwriter, as provider of service, as source of subsidies and loans, as promoter of national standards of 'decent living' and as economic and social diagnostician and repairman. True enough, the new liberal's faith in 'positive government' is a far cry from the ealier liberal's ideal of government restricted to the role of 'night watchmen'.[11] Indeed, the compulsions of quick development, and, where socialism has been accepted as the national goal, framing of policies to achieve targets such as full employment, satisfactory rate of growth, stable prices, a healthy balance of payment, more production and equitable distribution, etc., need a more positive state penetration and, *ipso facto*, bureaucratic intervention.

[8] J. N. Khosla, "Development Administration—New Dimensions", *Indian Journal of Public Administration*, Vol. XIII, No. 1.

[9] La Palombara, *op. cit.*

[10] Edward Shils, *Political Development in the New States*, The Hague, Monton and Company, 1962. Shils says, "Modern means dynamic, concerned with people, democratic and equilitarian, scientific, economically advanced, sovereign and influential."

[11] F. M. Marx, "The Administrative State", Ch. 1, Chicago, University of Chicago Press, 1957.

Bureaucratic Model-Making

The inescapable nature of this deep and all-round involvement of the bureaucrats into the affairs of the state and its vital significance from the point of development make bureaucratic model-making, suited to the development needs, a very interesting and worthwhile exercise. Building a general model of developmental bureaucracy is by no means an easy job—there are so many variables, imponderables and situational differences to be catered to in different developing countries that one 'do-all' prescriptive framework often borders on absurdity. No particular pattern of adaptation can be considered optional for development. Indeed, the developing countries present such a wide variety of 'crises configuration' and the context of 'challenge and response' is so different that a 'cure-all' bureaucracy can only be reality in the realm of concepts.

Weber's 'Legal-Rational' or 'Ideal Type'

It will be worthwhile here to have a look into the classical model of 'legal rational' or 'ideal type' of bureaucracy developed by Max Weber (1884-1920) if only to see how some of the traits or elements held valid in the Weberian exposition hold good today, what value do they command and what deviations are necessary in the new context. Weber's bureaucracy, 'the leading institution of the modern complex society irrespective of its political complexion, capitalist or socialist', has some significant characteristics like hierarchy, differentiation, written rules, closed career system with no lateral entry, etc.[12] It is apparent that Max Weber's was a scientific concept and his description of the bureaucratic characteristics was 'formal' and 'institutional'. The Weberian model can be regarded basically as a "theoretical construction, an abstraction from reality, which serves as a frame of reference for social research into bureaucratic reality"[13]. It is "virtually synonymous with rationality and objectivity in the administration of large scale organization".[14] This does not mean, however, that a rigid uniformity, even of structural and other features, should be assumed. Bureaucratic adaptation and innovation should be anticipated; in fact they are inescapable, in different political settings of both developed and developing countries.

It is well to remember that Max Weber's 'ideal type' or 'classic'

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[12] Max Weber, *Essays in Sociology*, New York, Oxford University Press, 1946.

[13] A. van Bram, *Bureaucracy* (Mimeo).

[14] Wallace S. Sayre, "Bureaucracies : Some Contrasts in Systems", *Indian Journal of Public Administration*, 1964.

model applies primarily to countries of Western Europe. Even as an analytical 'construct', Weber needs to be modified when applied to the American scene. American public administration is characterised by considerably more 'politics' than that of Western Europe, in that legislators and interest groups shape American administration processes in many ways by establishing direct communication—and—contact channels with the bureaucrats. This gives American system a dynamic political character that challenges Weber's view of bureaucracy as a passive neutral instrument. Moreover, Weber does neither take into account the 'dysfunctional' aspects of bureaucracy which may hinder the 'rational pursuits of organizational objectives' nor does he emphasise bureaucracy's informal character. Bureaucracy's 'other face' and the extra-bureaucratic values like individual needs for security, status, power, etc., which go to 'bend' rules, programmes, and goals of organizations did not form part of the Weberian design. The other points of criticisms of Max Weber's model are that it does not visualize, insofar as American system is concerned, emergence of career alternatives for public bureaucracy which affects Weber's concept of 'tenure for life' for bureaucrats. The concept of 'trained incapacity' (Veblen), the concept of 'occupational psychosis' (Dewey) and the concept of 'professional deformation' (Warnotte) have not been thought of by Weber, whereas they are so true to any developed bureaucracy.[15]

Bureaucratic Changes in Response to New Needs

Similarly, bureaucracy in operation in developing countries has also undergone a good deal of change in response to the new needs. Structurally, procedurally and even from the point of view of its own functionality, it has moved quite a bit from its classical purity. But that has been more in the shape of marginal adjustments or peripheral adaptations rather than fundamental changes directed to achieve a break-through into the developmental goals. Whatever changes in bureaucratic structures and functions are in evidence in developing countries are all mainly due to the compulsion of developmental assumptions, ideals and goals, based on society's revolution of rising expectation and the magnitude and scale of dynamic programmes of comprehensive political, social and economic modernization.

Generally speaking, when the major need of the society is creating a sense of 'nationhood' and national solidarity, the bureaucracy has to play, willy-nilly, what can be called an "integrative" role, and not merely an instrumental one. If prior to the acceptance of developmental goals by administration, bureaucrats were primarily employed

[15] A. van Bram, *op. cit.*

on 'watchdog' or 'apparatus' functions and they were wedded to 'status quoism', in a developmental era, with a none-too-well developed political sector, the bureaucrats being one of the powerful elite-groups, have to participate, in a big way, in the predominantly political functions. The degree of bureaucrats' involvement into the activities of political sector or output functions, like interest articulation, interest aggregation, political socialization, and political communication[16] varies in inverse proportion to the level of political development, and hence, will differ from country to country.

In the social sector, modernization process must take into account tasks like inculcation of rational values, building up dynamic individual or group attitudes, refurbishing age-old, moth-eaten social institutions, creating and channelizing, along constructive lines, new citizen-responses to absorb change and accelerate its pace, etc.

When, however, economic modernization is the overriding goal, the bureaucracy has to engage in the "goal-gratification and allocative sectors". Gigantic operations in the field of economic planning have to be undertaken by the government in order to bridge the gulf between the high national goal targets and low actuality level, to achieve which the governments, and hence bureaucrats, have to assume, quite often, leadership role as industrial entrepreneurs, have to enter the commercial and business field, construct an adequate and effective infrastructure, build up varying types of organization-forms like manifold para-state agencies, public sector undertakings, autonomous corporations, etc. The public administrators have, of necessity, to become managers.[17]

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[16] Gabriel A. Almond and James S. Coleman, *Politics of Developing Areas*, Princeton, Princeton University Press, 1960. Ferrel Heady also emphasised this multifunctional character of bureaucracy in developing countries, though he would not do the same for developed countries where bureaucracies 'resemble the diffracted model with its more restricted functional activity'. According to him 'there is a relationship between political modernity and bureaucratic specificity of function'. (Ferrel Heady, *op. cit.*, page 106). Almond and Powell would go to the other extreme and aver that bureaucracy displays even in developed countries the characteristics of 'multifunctionality'. They say, 'while all political structures are multifunctional, the specialised officialdoms and bureaucracies of differentiated political systems are more multifunctional than almost any of the other types of structure' (Gabriel) Almond and G. Bingham Powell, *Comparative Politics : A Developmental Approach*, Boston, Mass : Little, Bown, 1966, pp. 157-158.

[17] At the start of the Journey, it is under-development all over or as Maddick described it "misery-go-round" Henry Maddick, *Democracy, Decentralization and Development*, Asia Publishing House, India, 1963. The social structure of most young developing countr es is dominated by tradition bound institutions like caste, communalism, linguism, sectarian narrowism, or regional parochialism which set the tone of group behaviour; there is often class conflict between middle-class and other classes; there is the gap between the educated and the uneducated, and so on. Traditional bonds of authority still wield great influence in the matter of legitimacy of government.

The Concept of Confluence

Thus, in development administration, there has to be confluence of different types of development objectives and programmes—political, social and economic, and underpining all these, the managerial revolution. The regulatory 'input functions' like rule making, rule application and rule adjudications have also an important place in development administration. Government in developmental administration must necessarily cope with a series of significant major tasks, such as achieving security against external aggression and ensuring internal order, establishing and maintaining consensus on the legitimacy of the regime, integrating diverse ethnic, religious, communal and regional elements into a national political governmental units and between public authorities and private sector, displacement of vested traditional social interests, development of skills and institutions, etc.[18]

All these functions call for an appraisal of the type of functions that development administration would badly need. If, in terms of broad fields, development administration can be grouped under general administration, social administration, economic and financial administration, agricultural administration and so on[19], it will enable making a realistic and pragmatic assessment of the requirements of different types and categories of administrative generalists, technical specialists (like engineers, doctors, scientists, etc.), professional experts (like economists, statisticians, planners, agronomists, specialized social workers etc.) and so on.

Economic structure is predominantly agricultural; there is little or no infra-structure like communications, roads etc; industrial or entrepreneurial class is generally absent and the whole economy is consumption-oriented. A close-up of political sector reveals that policy making institutions like electorate, legislative bodies, interest associations, occupational or pressure groups, competing political parties, etc., or popular participation in the affairs of the state are either very much weak or absent. As against this, however, in most new States, because perhaps of long period of colonial rule, administrative or bureaucratic sector is comparatively well-knit, organised and strong. For a good close-up on this, please see Edward Shils, 'Political Development in New States', *op. cit.*

[18] Milton Esman, "Politics in Administrative Development", in Montgomery and Siffin (eds.), *op. cit.*, pp. 60-65.

[19] The French have broken these areas into the following four areas: General Administration, Economic and Financial Administration, Social Administration, and External Affairs : Please see Herman Finer, *Theory and Practice of Modern Government*, London, Methuen & Co. Ltd., 1965 (Reprint), p. 825.

The Administrative Reforms Commission (India) in their report on Personnel Administration has broken the governmental activities into 3 main groups : 'general administration', 'specialised administration', & 'technical and/or scientific administration'. The Commission has made further sub-groups between 'functional' and 'outside functional' services, posts, specifying the following specialisation in areas not falling within the province of "functional" services, namely, (*a*) economic administration, (*b*) industrial administration, (*c*) agricultural and rural development administration, (*d*) social and educational administration, (*e*) personnel administration, (*f*) financial administration, (*g*) defence administration and internal security, and (*h*) planning.

What categories of personnel are required in a particular country will, however, depend upon the level of development there as also the emphasis that is placed for developing a particular sector. For instance, if the emphasis is on industrial development, then the personnel categorization will be one that will be different when agricultural development is the focus. Each category, in turn, may need to be further broken down into sub-sector specializations in order to fit it into the total developmental plan-frame. While analysing the bureaucratic categorization, sectoral requirements, and training needs, etc., it would be worthwhile to adopt a more professional yardstick, for determining the kinds and levels of personnel-mix and skill drills.

What are the implications of such a romantic 'rendezvous' with developmental adventure for bureaucracy in general and the concerned 'action group' in particular? The 'management of change' demands certain fundamental changes in the structure and character of developmental bureaucracy.

Political Role of Bureaucracy

The most important change of foundational nature takes shape in the political role of bureaucracies in development administration which blurs the dichotomy between the policy and the administration. Though, traditionally speaking, it may be considered "contra-rational" political commitment of the bureaucracy and its policy-making and other political functions are often the critical ingredients of development itself. In the context of development, public administrators have to be "in political limelight" because they tend to be injected into the policy-making activities as against mere policy implementing functions. Time is evidently past when the public officials are expected to sit on the developmental sidelines, limiting their role to the fixing of general rules and to providing certain basic services and incentive for those private entrepreneurs who are the major players in the complicated and exciting game of fashioning profound changes in economic and social systems.[20] Even in the peak of developed polity, not to speak of developing societies, the bureaucracy cannot completely be 'aseptic' to politics—it is difficult, indeed impossible, for a top bureaucrat to be totally apolitical or to extricate himself from political-cum-policy cobweb. It is but natural that the political functions tend to be appropriated, in considerable measure, by the bureaucrats in a developing society, though perhaps with non-political motives.[21] For, when there is no

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[20] La Palombara, *op. cit.*

[21] Fred Riggs, "Bureaucracy and Political Development" in La Palombara, *op. cit.*

possibility of vigorous political activity in general in society, an elitist bureaucracy with a guardianship orientation must be the principal initiator of change.[22] In fact, the major decisions regarding national development, even assuming good amount of overall political direction or control, involve inescapable authoritative rule making and rule application by the bureaucrats. The whole concept of 'delegated legislation' is based on the closer association of bureaucracy with legislative processes, not merely from structural—procedural point of view but also from the angle of policy initiation and formulation. This is not the same as to bypass the political top. The entire gamut of relationship between the public bureaucracy and political executive (or minister) assumes a new complexion when bureaucrats are shot into the outer space of political activities. In an one-party system, political comitment of the bureaucrats is not only possible but may, in fact, be encourged. But in a two or multiple party system, where the political structures are normally more developed and where the possibility of regime change is real, no salaried bureaucrat will like a particular label to be attached to his chest, which might involve him in job risk in case of a regime change.

Bureaucracy and Regime Variation

It is but natural that the functions and characteristics of bureaucracy will undergo basic changes under different political regime-variations amongst the developing administrative system. It is (however) not necessary to go into the details of these various regimes[23] but suffice it to say each bureaucratic system has to adjust its relationship (with the political top) and its functional role in the light of a particular prevalent ecology. Obviously, bureaucracy under a stable liberal democracy will be functionally different from that in a single party polity with charismatic leader on top. This can be represented in the form of a chart which appears at p. 238 for facility of ready analysis[24]. Structure apart, even its functional and rationalistic characteristics will vary widely under varying types of 'apparat'. Some general trends

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[22] Ralph Braibanti, "The Relevance of Political Science to the Study of Underdeveloped Areas" in R. Braibanti and Joseph J. Sprengler (eds.), *Tradition, Values and Socio-economic Development*", Durban, NC, Duke University Press, 1961.

[23] For details, please see Ferrel Heady, *Public Administration Comparative Perspective*, Prentice Hall Inc. Eaglewood Cliffs, New Jersey. 1966, He examines bureaucratic characteristics under six different regimes such as traditional autocratic system; bureaucratic elite systems—civil and military; polyarchal competitive systems; dominant party semi-competitive system, dominant party mobilisation system; communist totalitarian system.

[24] Acknowledgement here is due to Richard L. Harris whose analysis of the "Effects of Political Changes on the Role sets of the Senior Bureaucrats in Ghana and Nigeria", in *Administrative Science Quarterly*, December 1968 is illuminating.

CHART SHOWING

ROLE SETS FOR BUREAUCRATS UNDER DIFFERENT POLITICAL SYSTEMS

Types of functions	*Complete Combination of multi-functional role set*	*Great Britain*	*In Ghana under Nkrumah Regime 1957-1959*	*In Ghana and Nigeria under Military Regime*	*In Nigeria before 1966-Military Coup*
Rule making — Policy Making	yes	—	—	yes	—
Rule making — Policy Advice	yes	yes	—	yes	yes
Rule Application — Programme Formulation	yes	yes	yes	yes	yes
Rule Application — Programme Management	yes	yes	yes	yes	yes
Rule Application — Programme Execution	yes	—	—	—	—
Rule Adjudication	yes	—	—	—	—
Interest Aggregation	yes	yes	—	yes	—
Interest Articulation	yes	yes	—	—	—
Political Communication	yes	—	—	yes	—
Political Socialisation	yes	—	—	—	—

can, however, be indicated here; for example, under a mature liberal public democracy, for public servants, there will be no high degree of political commitment, no high social representativeness, no deviation from merit system but high degree of autonomy, internal checks and external accountability, whereas, under unstable liberal democracy, there is likely to prevail high degree of autonomy internal checks, some degree of political commitment and deviation from merit system, but not much of external accountability on social representativeness. Similarly, in a single party communist regime, high social representativeness, political commitment and internal checks are expected, but no great measure of autonomy or external accountability or contra-rational behaviour like partiality or corruption, etc., whereas in a single party non-communist regime, there is sometimes social representativeness, often deviation from merit system and some internal checks. These generalizations, based on a survey made by Prof. S. E. Finer of certain emerging patterns in some developing countries of Africa and South America should be taken as indicative of some broad trends. It is admittedly true that the content of the goals (national and personal) as set by the top leaders, the method adopted for piloting them through, the total environment of a particular political system including the genius of the people functioning in that system would influence the bureaucratic model in its basic structural frame and its style of functioning.

Even making allowance for all this, general hypothesis about bureaucracy remains, however, that it is the means of carrying 'community action' into 'rationally ordered societal action'. Therefore, as an instrument of societalising relations of power, bureaucracy has been and is a powerful instrument of the first order for the one who controls bureaucratic apparatus.[25] This shows that in a normal situation, bureaucracy is not 'usurpative' in nature as it does not have any independent political design of its own though it does a number of politico-social functions on behalf of its political master. Indeed, one can aptly view bureaucracy, in this context, as an organization of personnel "bossed by a political control group made up of each department's top command supported by hand picked aids . . . all administrative structure is linked to political structure as a door is held to a wall".[26]

Rather than sitting in the driver's seat themselves, the bureaucrats would like to look for support from political leadership; civilian career officials are primarily motivated by "prudential neutrality" rather than by an urge to take over direct political power.[27] It is a doubtful

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[25] Max Weber, "Essays in Bureaucracy", Ch. VIII, Section 10.

[26] Fritz Morstein Marx, "The Administrative State", Ch. I, *op. cit.*

[27] F. M. Marx, "The Higher Civil Service as an Action Group in Western Political Development" in La Palombara, *op. cit.*

point, however, if neutrality in the strict Weberian sense of 'instrumentality' to political top is really conducive to the dynamic role carved out for development administrator as a change-agent. The widely held view in many quarters now is that a fully committed and well-motivated bureaucrat, identifying himself with an end-objective, will be far more effective as a catalyst of change, as commitment to a cause generates almost a religious response in the officials and helps stimulating role-playing by them within the frame of national goal.

Some Deviations

Perhaps some degree of deviation from a purely passive bureaucracy by introducing, at least, a limited kind of 'spoils system' for some top layers, may be necessary though its extent will depend on the willingness or capacity of working the political system with only the long-range interest of the country in view, availability of qualified personnel and also, to a great extent, on the alternative employment opportunities open to the personnel dislodged on regime change. Making top-jobs 'political appointments' is likely to attract available qualified people into the politico-bureaucratic system which may, in the ultimate analysis, give fillip to the political sector itself if it is not very strong already. But this obviously requires a careful assessment of all the implications of such a choice. Another alternative may be to allow civil servants to join politics for limited periods on the expiry of which they would return to their old posts but with all their service rights protected. This, however, depends, for its success, on the political maturity of the society and its acceptance by the political system. Still another idea in this context could be to make certain key posts elective. As is apparent, the crux of the development administration, particularly in a democratic set-up, is how to harmonise the political goals with the genuine developmental objectives. That is, the real ingenuity would seem to lie in discovering a device and organizing a *modus operandi* through which the ideology of the political top can be matched and balanced by the effective managerial competence at the bureaucratic level. To what extent this competence can or should be activated by a commitment similar to the one of the top executive is of course a matter which will naturally depend upon the total culture in different developing societies.

One limiting factor to the question of political commitment is, therefore, the frequency of change in the government through either peaceful transition of power or violent overthrow of an established authority. In a situation of political instability, or even stable developed democracy politicization of bureaucracy may result in frequent

'chopping-off' of top layer which may hinder, not help, developmental aims and, in such a case, it may be a better idea to advocate responsible or 'prudential' neutrality. This will enable bureaucrats to suggest the most rational feasibility alternatives and to sober the political executive by setting achievable targets, devising pragmatic methods for modernization, more realistic decision-making, programming and execution of developmental activities.

Bureaucracy for Development

It is not that the Weberian characteristics of an ideal type of bureaucracy, namely, hierarchy, specialization and training, professionalism, tenure for life, merit system, emphasis on rules, forms, etc., are not present in development administration. Development administration being basically nothing more than a planned change in administrative structure and processes consequent on new assumptions and orientations of developmental objectives, its focal interest is administrative development defined as "a pattern of increasing effectiveness in the utilisation of available means to achieve prescribed goals."[28] It necessarily includes "both qualitative and quantitative changes in bureaucratic policies, programmes, procedures and methods of work, organizational structures and staffing patterns, number and quality of development personnel of different types and patterns of relations with clients of administration."[29]

What is actually required, in the developmental context, is that its bureaucracy must be a rationally structured, more functionally oriented (dysfunctions of classical bureaucracy need to be reduced if not eliminated) and should be achievement-centred (through acceptance of different sets of norms). Bureaucracy will be there—it is the inescapable ingredient in any large organization but it has to be imparted a new meaning, a new rationality! It means that the bureaucratic organization must be goal-oriented and action directed, streamlined and well-dressed up for performance and achievement—it should have its eyes fixed on the horizon of result. The over-devotion to hierarchy, and strict super-ordination and subordination relationship may not be quite conducive to the new tasks which require, for their fruition, healthy

[28] Montgomery, *op. cit.*, p. 230. In his paper on 'Modernisation and Development Administration' (Prepared for the conference of the Comparative Administration Group, University of Maryland, USA in April 1966). Riggs also writes : "Development administration refers both to the administrative problems which arise as governments seek to promote agricultural, industrial, educational and medical progress, and also to the reform of governmental organisations and bureaucratic procedures which necessarily accompany these processes."

[29] Dr. J. N. Khosla, "Development Administration—New Dimensions", *Indian Journal of Public Administration*, Vol. XIII, No. 1.

team spirit, collaborative problem-solving approach, collegiate decision-making process, and collectively shared programme-responsibility. The hierarchical levels, where they exist—and they must exist only on functional considerations and on none else—may need to be drastically cut by the adoption of what has come to be known as 'level jumping'.[30] It should be possible to go in for more horizontal collaboration, where necessary, rather than fruitless vertical consultation all along the long line! The conventional 'organization-chart' builders may be asked to forget for the time being, their old theoretical sophistry. Indeed, it may be necessary to juxtapose the order and build up the bureaucratic structure, in a development situation, from the top instead of from the bottom. If our purpose is to have a device for ensuring sound but quick decisions and also effective implementation, what is needed is a band of decision-makers and managers, the former framing the policy and the latter managing the programmes. They, in turn, would no doubt, require staff aid, but the 'aides' should not outnumber the real functionaries. Indeed, there is little justification in having a large underground base of ill-paid, frustrated and disgruntled public servants, as no super-structure can stand on such layers of sand! The emerging structure would, thus, not be pyramidal, though the top will remain more or less pointed and narrow. The base will be relatively small as against disproportionately broad as now and in the middle level, the span would be wide. It should be possible to think of a brigade commander (in the administrative sense of the term, (of course) without a full brigade. Seemingly absurd but perhaps worth a thought and try! The much-discussed officer-oriented pattern of bureaucratic arrangement reinforced by expert staff-aid of various kinds like personnel, finance, etc., and at different levels, both at the headquarters and the field, will go a long way to eliminate some of the age-old problems of delayed decision-making and implementation.

There should be, as the Administrative Reforms Commission says,[31] "maximum possible rather than minimum necessary" delegation of authority. Excessive centralism, based on lack of trust for others, may be ruinous for development. A rationally ordered dispersal scheme

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[30] It is pertinent to refer here to the recommendation 14 of the Administrative Reforms Commission Report on 'Machinery of government and its procedures of work, (Government of India, New Delhi, 1968), which states :

"14(1)(a) There should be only two levels of consideration below the Minister, namely, (*i*) Under Secretary Deputy Secretary, and (*ii*) Joint Secretary/Additional Secretary/Secretary. Work should be assigned to each of these two levels on the lines of 'desk-officer' system. Each level should be required and empowered to dispose of a substantial amount of work on its own, and be given the necessary staff assistance.

[31] Administrative Reforms Commission Report on Delegation of Financial and Administrative Powers, Government of India, New Delhi, 1969.

will involve trusting a man, whatever may be his station, with commensurate responsibility and expecting him to produce result independently as much as he can, without a parasitical reliance on the higher and superior bosses to execute everything for him. There must be be better communication throughout the organization about its objectives and all functionaries must be imbued, and indeed positively motivated, with the organization goals. Not merely intra-organizational relationships but also inter-organisational behaviour patterns, and more so, the relations of administration with public must be structured and reshaped on much more constructive and sound lines. This obviously involves a stupendous exercise in human relations approach within the organization and a bold imaginative public relations campaign outside to sell the developmental 'hard ware'.

Unless there is adequate training of officials for development of personnel potentialities and faculties, or inculcation of correct attitudes towards work and the organisation objective, no experiments in structural and methods—innovation are going to succeed. There may be enough vegetative, better still weedy, growth of structural forms and procedural norms, but they will not bloom and flower at all. All structural 'explosions' and procedural boom will be drowned by the sheer weight and complexity and will ultimately reduce the system to next-to-nothing. Developmental bureaucracy to be effective must needs solve these structural-functional problems—though proper recruitment, well-oriented training and executive development programmes, and periodic 'spring-cleaning operations', etc.[32]

Irrelevance of Some Traditional Concepts

In this context, advocacy for jettisoning of some of the traditional and almost 'ritually' accepted 'concepts' connected with government service becomes awfully relevant. The whole business of 'security' of government employment, *i.e.*, the principle of 'once in, never out' requires a close critical look; indeed, a more purposive and a simpler method of 'hire and fire' but operated in cases of gross failure to deliver the goods may be tried with profit. Indiscriminate use of this 'fire' power may have 'boomerang' effect on the civil service which is already showing signs of strain in the matter of inducting good material into the public services. Even then there seems to be no logic at all in a taxpayer being forced to bear the burden of 'inefficiency', or in administration's tolerating a terrible load of proven incompetence! The whole chapter of employment-character and discipline and 'separation'

[32] Ch. VII of Report of the Study Team on Machinery of Government and its Procedures of Work, Administrative Reforms Commission, Government of India, New Delhi, 1968.

may need to be redrafted. Another concept of dubious importance is the hierarchy and status connected with such hierarchy, both in a service or among the services. Over-emphasis on this hierarchy, even when it displays malfunctional traits, cannot obviously be justified. Another phenomenon which, according to many, has done incalculable harm to the development of 'democracy in bureaucracy', is the stultifying immobility in the services. Once one is 'born' in any service, whatever may be the initial circumstances of that birth, one has inevitably to flourish or suffer extinction in that service. A system in which late flowering of 'merit', competence, aptitude or even individual excellence must have to be subordinated to only a service 'label' can by no means be called rational or achievement-oriented, and, hence, must be counted as contra-developmental in character. A much more flexible and a much freer movement among the services on the criteria of merit, aptitude, etc., perhaps should be the order of the personnel management system. As a minimum programme, the unification of the civil services with uniform conditions, pay and prestige, with no 'casteism' recognized or practised, should be attempted to salvage the lost morale of good many services! Class distinctions, wide differences in the conditions of service, and violent variations of norms in the matter of promotion and other vital service matters do exist, which go to seriously undermine and demolish the very concept that all sectors and functions of administration are equally important and, hence, all functionaries should be treated as equal role-players in the developmental drama. Apoplexy of privileges in one and anaemia of opportunities in others may one day lead to a complete collapse of the bureaucratic edifice. One may cite a simple illustrative example of adopting different norms for different services: in some superior services, 'good', as the yardstick for promotion, is good enough, whereas in other not so superior services, even 'very good' is treated as 'good-for-nothing'; in some, seniorty is, for all practical purposes, the basisfor promotion, while in others, outstanding merit is the criterion! Indeed, if 'meritocracy' has any merit in it, it is this that merit, wherever it is, must have to be watered, nurtured and allowed to flower!

Some other structural alternatives could also be thought of; one may be to experiment with two parallel 'developmental' hierarchies—one official and the other elective as in India's Panchayati Raj system or, as in some communist countries, the governmental bureaucracy can function side by side with party-hierarchy, one balancing the other as also complementing each other's inadequacies. The point taken here is that 'development' demands, administratively speaking, an inevitable de-emphasis on excessive centralism, cutting out too many competitive compartmentalized services, taking developmental

decision-making down to the base-line through trusting as well as entrusting the lower levels or field officers with real, as distinct from 'paper', power to take on-the-spot decision, and, finally, shortening the length of the pipeline for consideration and case-handling and so on. This will vitally affect all three aspects of public bureaucracy, namely, structure, methods of working and the character of the personnel.

A New Look Bureaucracy

In short, a development bureaucracy must have a new look, a new spirit, different attitudes and professional skill in a technologically dominated age. To quote Fulton Report:

> "Technological progress and the vast amount of new knowledge have made a major impact on these tasks and on the process of taking decisions. Siting a new airport, buying military supplies striking the right balance between coal, gas, oil and nuclear-powered electricity in a new energy policy—all these problems compel civil servants to use new techniques of analysis, management and coordination which are beyond those not specially trained in them."[33]

What is true in an advanced economy and a developed society like Britain, is also basically true in any developing and modernizing community. In fact, leaving aside the technological sophstications, or some of the concrete problems of the West as such, the fundamental frame is the same: the administration working for change, a change accepted by the national policy-framers and bureaucrats master-minding the whole transformation-process. And in the process, the bureaucracy must also a change so that it is not outpaced, outflanked or out-manoeuvered by the velocity of total societal change—technological, economic, political, and also international.

The Need for Professionalism

This underscores the urgent need for professionalism in civil service and acquisition of appropiate skills, namely, conceptual, technical and human relations.

After dilating on the new tasks of the government, the Fulton Report talks about the qualitative aspect of the civil service as under:

"Even this brief and impressionistic description is perhaps enough

[33] The Fulton Report—The Civil Service (London : Her Majesty's Stationery Office, 1968, p. 10).

to make it clear that, as a body, civil service today have to be equipped to tackle the political, scientific, social, economic and technical problems of our time. They have to be aware of interest and opinion throughout the country and of many developments abroad. In short, the civil service is no place for the amateur. It must be staffed by men and women who are truly professional.[34]

That professionalism in the civil service is an inescapable 'must' for the developing society can be disputed by none. To quote Administrative Reforms Commission's report on Personnel Administration:

"The three Study Teams dealing with Personnel Administration and the one on Machinery of the Government of India and its procedures of work are unanimously of the view that the future administration has to be increasingly oriented towards specialisation and that an important objective of personnel administsation should be to create and nurture the needed specialism."[35]

Some Qualities of Development Administrator

This brings us to the qualities of development administrator, at least at the higher levels. There is no denying the fact that at lower and middle levels, these public servants must be 'functional' or, shall we say, a kind of specialist, either through pre-entry vocational or professional education or through post-entry specialization in any branch of administration. As one moves up the steps of the responsibility ladder, the qualities that become significant are not so much the practice of specific technical skills but certain sound general traits like balance, perspective sense, judgment, coordinative approach, far and foresight. Paul Appleby suggested the following three qualities as desirable in the high civil servant, namely,

(*i*) "The quality of philosophy"—the capacity to see public policy in terms of thousands of different actions and to relate these actions to each other in terms of public interest.

(*ii*) "The governmental sense"—the ingrained disposition to put the public interest first, etc.

(*iii*) The public relations or political sense![36].

[34] The Fulton Report, *ibid.*

[35] The Administrative Reforms Commission, India, Report on the Personnel Administration, Government of India, New Delhi, April, 1969, Ch. III. It is not possible to go into the details of the four Study Teams' recommendations, referred to above, for lack of space. The author proposes to do a full article on 'professionalism in the Civil Service', where the various parameters of this problem will be tackled.

[36] Paul H. Appleby, *Big Democracy*, (New York : Alfred A. Knopf, Inc. 1945), p. 43.

The essential virtues that can be cited as critical in a development administrator are, thus, (*a*) "culture", which gives him a liberal and balanced frame of mind and opens before him a healthy constructive perspective of men and matters, and (*b*) "skill", and "expertise" which equips him in the efficient discharge of professional functions.

These apart, a development administrator must be action-motivated; committed (not merely from a rational angle but emotionally as well) to developmental ideology as his article of faith should be "more free wheeling, less adhering to administrative forms, less attached to importance of hierarchy and status";[37] should have a problem solving approach and not an unduly legalistic, routinistic and precedent-bound attitude; should be concerned more with result and achievement than with mere rule-application; and must never be a prisoner of indecision. As Hoover Commission's Task Force said;[38] "his foresight must equal the insight of a host of critics". The development administrator, being the captain of a team, must be a dynamic coordinator of a group effort, and not an individualistic leader: the symbol 'leader', in the words of Fritz Redl,[39] has become "anachronistic and should be replaced by the terms, central or focal person." In short, the developmental bureaucrat has to be "analytical as a thinker, creative and dynamic as a goal setter; pragmatic as a planner, and innovative as a programme."[40]

Conclusion

In any scheme for developmental bureaucracy, structural refabrication is indeed necessary; so are the methods and procedures of work. Unless these two are tailored to the particular needs, and reformed to conform to the newer norms of changed ethos, it is impossible to move the 'machine' towards the determined goal and achieve desired level of development! But much more significant, from the angle of model-making for a developmental bureaucracy, is the man, the bureaucrat, the raw material! Unless this man is made to look different or asked to think differently or motivated to function more purposively, no amount of investment in structural sophistication or modernization in machine-procedure will be in a position to hit the jackpot by way of raising the level of developmental productivity. The critical ingredient,

[37] La Palombara, *op. cit.*

[38] The Hoover Commission, Report of the Task Force on Personnel and Civil Services.

[39] Fritz Redl, "Group Emotions and leadership", *Psychiatry*, November 1942.

[40] Taken from a paper presented by the author to a seminar on *Development and Bureaucracy* in the Institute of Social Studies, the Hague, 1968.

the bureaucrat himself, must, therefore, be freed from the existing conceptual orthodoxies, age old affiliations and narrow mental grooves so as to be the fitting torch bearer of a new and bright development order!

BUDGET FORMULATION AS A DECISION-MAKING PROCESS IN THE UNITED STATES GOVERNMENT

*Carl W. Tiller**

THE budget process shares with the legislative process a significant role in governmental decision-making. In the enactment of legislation, decisions are reached as to the regulatory, advisory, promotional and direct action activities which the Government will undertake. In the budget process, decisions are reached with regard to the scope and level of such activities for the year just ahead. When the budget prepared by the executive branch embraces estimates for proposed legislation and is the occasion for announcing such proposals, as in the United States budget, nearly every significant decision with respect to governmental programmes gets caught up within the process of preparing the budget.

It is in the course of the budget process that decisions must be reached on such questions as these: How large should our defense forces be next year? Shall we proceed as fast as feasible with the development of a proposed new weapons system? What are our goals with regard to exploration of outer space for the rest of this decade? How shall the national government assist the states in providing and staffing schools for children? What steps should be undertaken to reduce the functional illiteracy of adults? Considering the poor and the hungry, what needs to be done to increase food production and improve its processing and distribution? What programme of research in health problems should be scheduled for next year? How can the Government best assure all citizens of equality of employment opportunities? Where should new postal facilities be constructed, and what type and size of facilities are needed, in order to receive, transport, and deliver the mail promptly and accurately?

Budget decisions relate to two levels of concern—the aggregates of financial transactions, and the budgets for individual programmes and agencies.

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*This article is based upon a synthesis of several addresses delivered by the author at the Indian Institute of Public Administration in July and August 1964, with some subsequent updating.

With regard to the *aggregates*, the decisions involve familiar issues in the field of public finance:

(1) How much total spending should be proposed?

(2) How much of that spending should be covered by ordinary receipts, and how much, if any, by borrowing (or, how much previous borrowing should be repaid?)

(3) With respect to ordinary receipts, what reliance should be placed upon the various alternative forms of taxation, and upon miscellaneous charges for services and other benefits?

With regard to *individual programmes*, three types of decisions are either explicit or implicit in each budget proposal:

(1) Programme output—what (and how much) should the Government seek to accomplish in this fiscal year?

(2) Resources input—how much manpower and what other resources of material and services will be required to obtain the desired output?

(3) Pricing—what price and wage factors shall be used to convert the quantitative input estimates into the amounts of money required?

These three kinds of decisions are not of equal value or importance. Conclusions with respect to the programmes to be undertaken and the outputs to be sought are of substantially greater significance—especially at higher levels within the Government—than decisions with respect to efficiency, and the translations of requirement into money. The budget process is not primarily a device for saving money; it is primarily a device for making rational decisions with regard to Government programmes.

By way of illustration let us consider the preparation of a budget for reforestation activities. The planning and nurture of trees is undertaken as a contribution toward a number of objectives including the development of sources of lumber for building purposes, the contribution of trees at higher elevations toward a reduction in flooding, the contribution of trees toward the goals of conservation of gamebirds and animals, and the usefulness of timber as a source of income for the small farmer. Therefore, the Government engages in reforestation on its own lands and assists in the reforestation of privately owned lands.

In developing a budget for this purpose, attention must be concentrated upon the desired output; for instance, how many acres (hectares) of land should be reforested in the year? This in turn requires an estimate of how many man-years of labour, how much travel and transportation, and what quantities of supplies and materials and equipment are necessary to accomplish the desired output. This necessarily involves decisions as to the efficiency and productivity to be expected in the operation. Lastly, the man-years of labour and the quantities of other input items must be translated into the amount of dollars required, through the application of estimates with respect to wage rates and prices which will prevail during the budget year. It is important to recognize that the consideration of inputs by object class are only supporting factors in arriving at final budget decisions; they are subsidiary to, and support, decisions on programmes. The decisions with respect to individual programmes may of course be influenced by decisions with respect to the aggregates. Every year many demonstrably worthwhile programme proposals must be rejected in the course of budget making because they cannot be fitted within the desired aggregate limits which will fit the economic policies of the Government.

The importance of the decisions reached in the budget formulation process is such that they cannot be entrusted to the budget office alone. Instead they must be made by the responsible officials who are in charge of managing the Government. In the United States the President is considered the general manager of the executive branch, and the budget presented to Congress annually represent the conclusions of the Budget Director, although as the President's personal choice to assist in budgetary and management matters, the Budget Director aids the President in reaching his conclusions.

A goal of budget systems development is to so arrange the methods of budget formulation so as to facilitate good decision-making.[1] Provisions which will contribute to this include:

(1) Providing a clear delineation among the factors in decision-making—that is, requiring a separate look at the output side of the budget as distinguished from the input side. For each appropriation and fund in the United States budget two schedules of data are required which come to the same totals. One of them emphasizes output and shows "programme by

[1] Related goals of budget systems development are to arrange the design of the budget and the classification of data in the budget *presentation* so as to facilitate good *decision-explaining*, and to arrange the methods of budget *execution* so as to facilitate good *decision-enforcement*.

activities". The other emphasizes input factors and classifies financial data according to uniform objects of expenditures (salaries, travel, etc.).

(2) Utilizing a structure for programme analysis which truly represents the various objectives of the performance which the citizens may expect from their Government. In our experience in the installation of "performance budgeting", we found that this requires a distinct effort to focus on objectives or ends, as distinguished from work methods or means toward the ends.

(3) Determining upon a system for measuring performance. Measures chosen for any one programme must have a reasonable degree of homogeneity, consistency, and reliability over time. Ideally, measures of accomplishment or results are to be preferred over measures of work done, although even the latter may be helpful in reaching programme and budget decisions.

(4) Requiring consideration of input-output relationships. Most simply stated, this may involve cost accounting, in which the results are stated in terms of cost per unit of output. In more sophisticated form, this comes to cost-benefit analysis, requiring that the value of the output be quantified in terms of dollar benefits to the citizens, thus permitting the development of a ratio that shows the number of dollars to be received in benefits for the number of dollars to be used in carrying on the programme. This latter type of analysis found its earliest development in the field of public works relating to water resources, but it was seen more recent applications to other areas of governmental activity.

(5) Developing alternatives, together with information on the probable consequences of adopting each of the suggested choices. Decision-maker necessarily involves a choice; if the decision-maker has no choice, there is nothing to decide. A system that provides a range of choices, rather than merely requiring a yes or no dicision, will best serve the goal of obtaining wise decisions. The alternatives may include choices as to the objectives, choices as to the methods to be used, and choices as to various levels of activity to be reached within the period of operation.

(6) Providing for searching review and analysis of the basis for continuing programmes already in being, as well as for the inauguration of new or developmental programmes.

(7) Seeing that reliable factual data is the foundation for the budget estimates. Most reviewers of budget estimates like to compare the estimates for the budget year with actual results for the most recently completed year. The accounting system should be so structured as to provide information on the actual results in accordance with both the programme classifications and the object classifications which will be used in the budget process. Programme measurement systems similarly should be constructed to provide meaningful data in terms of programme classifications. Both the financial accounts and the measurement of output accomplishments should be subject to independent verification.

(8) Seeing that the budget process involves in a responsible manner those who are in the chain of command. Budgeting is a necessary tool of management, and those who are to manage a programme might well take part in the formulation of that programme. In the United States Government each department and each independent agency has a budget officer, together with professional budget staff, but the budget requests coming forward to the Bureau of the Budget must not be the department budget officer's ideas alone; they are to represent the official requests, and therefore the best judgment, of the head of the department or agency. Similarly, within the departments and independent establishments, there is encouraged the practice of engaging the 'line' operators in the formulation and evaluation of budget requests.

(9) Placing the annual budget within a longer time frame. Since 1961 our budget instructions in the United States Government have called for each agency to include with its annual budget a multi-year financial plan which goes from 3 to 5 years into the future, and enables the current budget to be examined in the perspective of a longer period.[2]

(10) Utilizing effective techniques of analysis. These include the various facets of what is known as 'operations research' as well as the advanced techniques described as 'systems analysis'.[3] It also includes the thorough application of common sense.

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[2] In a nation which, unlike the United States, has a series of five-year plans, the budget process ought to be a very useful tool in relating public sector activity each year to the overall plan for the longer period of time.

[3] Emphasis upon analytical techniques is one of the contributions of the Planning-Programming-Budgeting system which has gained attention since the time that these lectures were delivered.

(11) Providing an orderly sequence of events in the budget process, with sufficient time for the analysis and reflection that are essential to decision-making. This is easy to plan but hard to execute. Budget staffs as well as decision-makers find events crowding in upon them in the last weeks before the budget must be publicly presented. However, it should be noted that the President of the United States reserves a substantial block of time in late December and early January each year to attend to the decision-making processes which are necessary for the budget which is presented to the Congress between January 20 and January 30.

TRAINING OF CIVIL SERVANTS IN JAPAN

B. C. Mathur

In recent times training of Government employees in Japan has been receiving increasing attention to enable the civil service to cope with the need for modernization of governmental administration and improved efficiency. It started to be viewed comprehensively only after the enactment of the National Public Service Law in 1947. In order to appreciate the significance of programmes for training of civil servants in Japan, it would be useful to understand the nature of, and the system of recruitment to, its civil service.

The National Public Service Law and Recruitment System

The National Public Service of Japan is divided into the regular service and the special service, as provided in Article 2 of the National Public Service Law. The special service is comprised of important positions such as the Prime Minister and Ministers of State, judges and personnel of the courts, officers and employees of the Diet (Parliament) and personnel of the Self-Defence Agency. The total number of such employees is about 310,000. The regular service, on the other hand, consists of all the positions in the national public service other than those in the special service and the total number of these personnel was around 850,000 in the beginning of 1968. The National Public Service Law is applicable to all the employees in the regular service and the National Personnel Authority is responsible for management of the regular service, including its training. The National Public Service Law envisages a recruitment system based on a position-classification plan although it has not been implemented to any great extent and the current recruitment system is being operated on a foundation of job-classification under the Pay Law.

The Entrance Examination conducted by the National Personnel Authority may be broadly divided into three levels, namely, a senior examination for college graduates, an intermediate examination for junior college graduates and a junior examination for senior high school graduates. The senior examination is further divided into the A-class and the B-class examinations, each of which has 26 subjects

or fields of specialization, like, law, economics, electricity, mechanics, agriculture, etc. The successful candidates of the A-class examination are considered for future executive positions and are appointed, in principle, to Grade 6 of the Salary Schedule for the Administrative Service (I). The B-class examination is meant to test the ability required for the performance of the duties of a Grade 7 position.

The intermediate examination is divided into eight branches, such as, administrative work, electricity and telecommunication, mechanics, etc. The successful candidates are generally eligible for appointment to Grade 8 positions which require the abilities of a level comparable to graduates from a junior college. The junior examination is divided into thirteen branches, including general clerk, special-category clerk, taxation employee, technical helper in electricity, etc. The successful candidates are eligible to appointment to Grade 8 positions other than those which require the abilities of a level comparable to a graduate from a junior college.

The recruitment age for college graduates is between 22 years to 34 years, for junior college graduates 20 to 28 years and for senior high school candidates 18 to 24 years. In practice, however, no one over 27 or 28 years gets the job. There is no restriction on the number of chances a man can take in the various examinations. It is also interesting to note that the senior examination is of a university standard although a university degree is not essential for taking this examination. Out of about 1,000 candidates selected every year, about 10 to 20 are only high school graduates who have studied at home. About 25,000 candidates every year take the senior examinations, about 1,300 succeed and about 700 get the jobs. Some go away to industry and some continue in universities for further studies. The National Personnel Authority gives certificates to about 1,000 people who have qualified at the examination and the Ministries are again given a chance to select officers out of this list. Generally, five names are given to the Ministries for each vacancy. This is something like the American pattern of recruitment and was adopted after the World War II. Normally, people who obtain the highest positions prefer to go to Ministries like Finance, International Trade, Industry and other economic Ministries where chances of promotion are better or they go on deputation to some of the agencies like the Planning Agency. But each Department or Ministry is quite independent in a way and officers are appointed by them for their entire career. In Japan, it does create a certain amount of rigidity and sectionalism and training facilities are now being provided for coordination work.

The National Personnel Authority (N.P.A.) conducts the recruitment examination, but in some cases where the number of vacancies is small, as in the case of agronomy, the N.P.A. authorizes the Ministry to conduct the examination. The Foreign Service Examination is conducted by the Ministry of Foreign Affairs which is so authorized by the N.P.A. The successful candidates have to undergo oral tests which are in two parts. The candidates are examined individually for 15 minutes and in groups of 7 to 10 for one hour for non-technical positions. The oral test is only a qualifying test, but no marks are added. There is also a physical test, as in India, but this is only to ensure that the candidate is not suffering from tuberculosis.

Besides the National Government, people also compete for prefectural offices where the pay scales are generally higher than in Government. It may seem irrational, but some of the prefectural Governments which are supposed to be like the State Governments, but are actually more like local Governments, are more affluent and pay a much higher salary than the National Government, although bright candidates are keen to join the Central Government because of its higher status and power. It may also be pertinent to note that science graduates do not take the administrative service examinations. The subjects chosen are economics, constitution, civil code, political science, public administration, public administrative law, social policy, international relationships, finance, etc. Finance is a regular subject in a B.A. course and is offered in the faculty of economics or law. Very few women compete for these examinations. Most women take up work in fields such as chemistry, psychology, etc., and not general administration.

Grades in Civil Service

There are 8 regular Grades in the Japan Civil Service and the first appointment after passing the senior entrance examination—A-class—is to Grade 6, regardless of age. Each grade has a number of steps, as in the United States. The pay at step 1 of the Grade 6, where the elite recruitment takes place, starts with Yen 25,700 (approximately over Rs. 500) per month whereas the maximum pay of Grade 1 is 1,33,100 Yens per month. In addition, there are two higher grades over Grade 1 for the Directors of the Bureaus and the Administrative Vice Ministers in-charge of various Ministries. The latter are like Secretaries in the Government of India. Generally speaking, the level of employees at various levels would be as follows:

Grade 8 Clerical workers

Grade 7 Supervisory workers

Grade 6	Unit Chief in a local branch of the Ministry or a Supervisory Officer in the Ministry
Grade 5	Unit Chief of the Ministry
Grade 4 *and* *Grade* 3	Assistant Section Chiefs
Grade 2	Section Chiefs
Grade 1	Deputy Director of Bureau

There are a little less than 1,000 officers in Grade 1 and a little less than 4,000 in Grade 2. The total number of administrative officers in December 1967 was about 2,40,000. Government servants in Japan are also paid bonus which works out to 4 to 5 months' salary every year. In theory the bonus is given for good work, but every one gets it. Similarly, if a person does not take his annual leave, he gets extra payment in lieu of the leave not taken.

A person is appointed as a Branch Chief after about 5 years of service and an Assistant Section Chief after about 14 years of service and a Section Chief after 15 to 16 years of service. Directors of Bureaus who do not make the grade to Vice ministership retire as a matter of practice when a junior Director is appointed as Vice Minister. There has been no compulsory retirement age in the Japanese Civil Service except in the case of judges and public procurators and the retirement age of higher civil services in various Ministries varies from 49 years to about 56 years. It is significant that Administrative Vice Ministers generally stay on in the job for about two years only and retire at an average age of 52 years. It is more a matter of tradition in a Department. For many higher civil servants, retirement, instead of terminating their active careers, launches them upon new careers in business, politics and other fields. Having acquired a set of skills and reputation, the retiring Japanese higher civil servants usually assume important positions elsewhere in Japanese society.

Efficiency Section of N.P.A.

The Efficiency Section of the National Personnel Authority is responsible for training of the civil service. It has 14 people including the Section Chief and 5 Assistant Chiefs. The Assistant Chiefs are in charge of:

(*i*) co-ordination of general affairs in the Section;

(*ii*) planning section or unit

(*a*) development of methodology;

(*b*) compilation of text books—This section generally entrusts this to University professors;

(*c*) guidance and coordination to various Ministries;

(*iii*) first training unit—supervisory training;

(*iv*) second training unit—the section chief training course; and

(*v*) overseas training unit.

Under the National Public Service Law, each Ministry is responsible for training of its officers. The National Personnel Authority which arranges training itself is also responsible for the coordination of training programmes and supervisory training in other Ministries. The inter-Ministry training is provided by the N.P.A. which provides text books to other Ministries and helps in the development of efficient methods. The text books are arranged after meeting the representatives of various Ministries. There is a Council of Department Training Officers, a body established for the purpose of maintaining liaison with the Training Officers of the Ministries and Agencies and for study and consultation on various training problems. This Council holds management conferences and prepares reports on employees training and education in Japanese Government and also helps in revision of pamphlets for training of new entrants into the National Public Service.

Training of Bureau Chiefs

There is no institutional training for Bureau Chiefs or Directors. They are very senior officers and meet in the Prime Minister's office once a month to discuss current topics. Important people from private enterprise are also invited and problems of management and even problems of diplomatic nature are discussed between 8.30 and 11.00 in the morning.

Training of Section Chiefs

The training of Section Chiefs is the responsibility of the Bureau of Employees Relations of the National Personnel Authority and is conducted about four times a year in the form of a week long residential course under the name "Management Conference". The number of participants in each course is around 20. Senior management

people from private enterprises also participate in this programme. Various administrative problems are discussed from diverse view points. One week before the commencement of the course, the President of the National Personnel Authority addresses all the participants and poses a few problems of administration. Some of the points posed relate to the relationship of the political party and pressure groups in various (actual) situations or environments, problems of technical innovation, international relations, viewing Japan after 20 years and the changes in administration that would be necessary to cope with the changed circumstances. In such a course there is generally a talk by a priest or a high dignitary on subjects like "My opinion of the way of life—what I want of Government officers". There are two sessions in a day between 9.00 A.M. to 12.00 noon and 1.30 P.M. to 4.30 P.M. In each session 1½ hours are spent on lectures and the balance on questions and answers. Some of the problems are again discussed in groups between 7.00 P.M. to 9.00 or 9.30 P.M. The participants are required to write notes on the subject discussed. The evenings are generally for group discussion or reading assignments. In the morning session, very often an author of a book discusses the book read by the trainees the previous evening.

An interesting sidelight of this training is that they use at least one Case Study dealing with organization and leadership, but the Case Study is not distributed very much in advance. This is so because the participants are supposed to make quick decisions and this is lost if a Case Study is made available in advance. It is, no doubt, debatable whether this method is really good because a Case Study may help in taking decisions, but in a training programme a case study is not generally used for arriving at a decision to any problem but more for discussing various issues in a given situation. The programme is limited to one week not only to keep down the cost of the course but also because senior officers cannot be spared for a long time. The Bureau Chiefs have to go to the Diet frequently to attentd subcommittee meetings along with their Section Chiefs. The entire cost of training is met by the National Personnel Authority. Only transport is provided by the Ministries. Board and lodging is paid for by the trainees who get TA and DA for this purpose. This programme was started in the year 1962. Seventeen courses had been taken up till June 1968.

Institute of Public Administration

This Institute is like a Bureau under the National Personnel Authority and is the Central Institute charged with the training of Government

employees capable of assuming later on senior positions in administration and management. This Institution conducts administrative training:

(*i*) for the levels of Departmental Branch Chiefs;

(*ii*) for the Departmental Assistant Section Chiefs; and

(*iii*) since 1967 training for new appointees of levels of college graduates in cooperation with the Prime Minister's office.

Recently, the Institute has also taken up a new training course known as "Japan's Group Training Course in National Government Administration" for Government officials of the countries in the Asian region with the cooperation of the Ministries and Agencies of the Japanese Government as well as of the Overseas Technical Cooperation Agency. The Institute has been conducting various training programmes in Tokyo, but in 1968 a new building has been constructed in Iruma City, about 60 Kms. west of Tokyo and most of the training is now done in Iruma City.

Administrative Training for Levels of Departmental Branch Chiefs

The N.P.A. started the administrative training in October 1956 although on-the-job training designed to increase the working efficiency of junior employees has been going on in various forms by Government departments. This programme has been divided into two courses, "A" and "B", the former catering to the needs of administrative staff chiefly majoring in one of the social sciences like law and economics and the other for the technical staff chiefly majoring in one of the natural sciences like physics and also engineering. The purpose of this training is "to equip young capable officers of various departments with a broad administrative vision, high-level managerial abilities and a critical insight into social problems". The trainees of each course are persons generally holding positions in Grade 5 of the Salary Schedule and should have an outstanding record of work performance. They should be persons under 34 years of age (the average age is 30 years). There are a little less than 50 trainees in each course which is a full time course. The period of training has been 13 weeks but recently it has been reduced to 11 weeks mainly because Ministries do not want to spare officers for such a long time. These courses are held three times a year.

Training is conducted mainly in the form of lectures and seminars, and includes study tours to industrial and other installations. Lectures are divided into general and special lectures. General lectures are

on international relations, economic policy, the constitution; administration of each ministry and local autonomy; general principles of administrative management, organizational management, personnel management and office management; and introduction to science and technology, atomic energy and electronic engineering. The contents of general lectures given in a course during 1967 are given in Table 1. The details of the various subjects are given in Table 2.

Special lectures are intended mainly to provide the trainees with a board common sense and a wide knowledge of the society. These lectures take up 42 hours and cover current topics, philosophy, history, literature, natural science, etc. There are also seminars designed to promote voluntary study by the trainees and their mutual enlightenment of various problems through discussion. The subjects taken up in the seminars are given in Table 3.

In conducting exercises in tasks, the trainees of both "A" and "B" courses are organized into three syndicates consisting of 15 to 16 persons each. The chairman and the reporter for each syndicate are appointed by turns. The exercise in tasks includes presentation of tasks, study of tasks, preliminary discussion, reports, discussion by the whole course, writing of essays, exercise in administration and management, case study, study of administrative operations, reading of books, exercise in decision making, study of judicial precedents and study tours to distant prefectures.

Administrative Training for Departmental Assistant Section Chiefs

Since 1967 two courses for Departmental Assistant Section Chiefs are organized every year by the Institute of Public Administration, again, with a view to equipping the departmental staff with a broad administrative vision and higher managerial abilities. The course is open to persons holding a position in Grade 3 of the Salary Schedule. The participants should be under 40 years of age and the number of participants in a session is between 35 and 40. The training course lasts a month. Training is conducted mainly in the form of lectures, discussions and seminars. It also includes a round table conference as well as study tours to some enterprises. During 1967 and 1968 the training course included a week long residential session in Tokyo. With the shifting of the Academy to Iruma city, the major part of the course will be residential. The details of the topics covered under lectures and seminars are given in Table 4.

Joint Training for New Appointees of College Graduate Levels

Unlike India where new recruits to All India and Central Services are sent to the National Academy of Administration and to other training institutions for a long period of training, the new appointees in Japan undergo a five-day orientation course in the early part of April every year. The trainees are addressed by the senior government officers on what new public servants should be in public life. This is supposed to enhance their morale. The subjects of study in this training include study of the Cabinet system; coordination and integration of the government administration; the civil service system; the attitude of mind of the public servant; administration and public finance; and the relationship of administration to science and technology. Some distinguished government officers also speak to the trainees about their experiences of life in public service. Sometimes lectures by eminent people in private sectors are also added to the programme. The training programme is conducted by the Institute of Public Administration under the joint sponsorship and with the cooperation of the N.P.A. and the Prime Minister's office. The Institute also takes up joint training programmes for their newly appointed employees of individual government departments. This is expected to achieve training results more effectively when administered as a joint training programme that cuts across departmental lines. After such joint training programmes are over, the employees concerned undergo further training in their respective departments.

Group Training Course in National Government Administration for the Asian Region

The Group Training Course is organized by the Government of Japan as part of its Technical Cooperation Scheme (Colombo Plan and other Schemes) for developing countries and aims at contributing to the development of departmental administration and public policies of the Central Governments of participating countries, and also at promoting technical cooperation in this field between these countries and Japan. So far India has not taken advantage of these courses which are of 14 weeks' duration and are held during January and April. These courses are conducted in English. In addition to the lectures, the training course is conducted by means of participants' reports and comparative study, discussion, investigation and study through assignment of participants to the ministries and agencies concerned (about 2 weeks) and study tours (about 10 days.)

Training of Trainers

The National Personnel Authority trains instructors or Assistant

Section Chiefs who are supposed to teach supervisors in their offices. This course is of eight days duration and is based on the seminar pattern. Some supervisors are trained direct by the National Personnel Authority in Tokyo and some by the eight local branches of the N.P.A. These regional offices conduct seven courses every year and one course is held by the Central office. Fifty seven courses were conducted till June 1968. The number of trainees is about 17 in each course and about 1,000 instructors have already been trained by the N.P.A. The Efficiency Section of the N.P.A. is responsible for training of trainers of various ministries whereas the regional offices train the trainees of the branch offices of the various central government departments.

In addition to the above courses, each Ministry has its own training institution and conducts a course for their trainers separately. New instructors are trained in this course and the main item is how to develop a curriculum and understand various methodologies used in training. They are also trained in evaluating various training programmes. Such courses are of four days' duration and all trainees have to write reports. Evaluation is not an easy task, but in these courses the methods adopted are as follows:

(*i*) all the trainees are asked to give their opinion about the course;

(*ii*) an expert evaluator attempts a seminar and observes the atmosphere in the seminar;

(*iii*) the evaluator makes all the trainees write a report on the programme and judges from such reports whether the trainees have learnt a particular technique properly.

(*iv*) senior officers from the ministries also attend the Seminars to evaluate the progress and give their impressions.

Local Autonomy College

Appreciating a growing awareness among local governments (prefectures) regarding in-service training, the Ministry of Home Affairs in Japan established a local Autonomy College in 1953 as a local service training institute at the national level in Tokyo to provide advance training for managerial and supervisory officials of local Governments. The courses are also open to National Government officials engaged in activities affecting local administration as well. The College offers four general courses and two special courses for officers working in taxation departments and public enterprises.

Training Abroad

In addition to various training programmes for civil servants in Japan, the Government of Japan also deputes its officers abroad mostly to the U.N., U.S.A., U.K., Germany and France. These officers are deputed to obtain a Master's Degree. Generally they go for two years to study administration and brush up a foreign language, primarily English. About 16 officers are sent abroad every year. The selection of officers is done by the N.P.A. and such officers are chosen who have experience in an office for less than five years, who have some knowledge of the foreign language and whose job is related to the type of experiences available in foreign countries. These officers do not include officers of the Foreign Service for whom there are separate courses.

Conclusion

Although institutional training is comparatively new in Japan, the Government is extremely keen on developing training programmes for various levels of officers, both technical and non-technical and the training institutions are taking their job very seriously. The Government are also very particular that initially the training efforts should be directed to officers who show promise and are likely to occupy important positions in future. There is still no rule requiring officers to undergo a certain training before they can be promoted, but in practice most bright officers are selected and deputed for various training programmes.

TABLE 1*

CONTENTS OF GENERAL LECTURES GIVEN AT THE ADMINISTRATIVE TRAINING FOR LEVELS OF DEPARTMENTAL BRANCH CHIEFS IN FISCAL YEAR 1967

The "A" Course (135 *hours*)

Area	*Subject*	*Hours*
Administrative Management (27)	General Principles of Administrative Management	9
	Organization Management	3
	Personnel Management	6
	Office Management	9
Law (6)	The Constitution	6
Economics (36)	National Income	6
	Economic Structure	6
	International Economy	6
	Economic Planning	6
	Fiscal Policy	6
	Monetary Policy	6
Politics and Social (21)	International Politics	3
	Population Problems	3
	Wage Theory	3
	Social Policy	6
	Labour Problems	6
Science and Technology (18)	Introduction to Science and Technology	6
	Introduction to Natural Resources	3
	Atomic Energy—Electronic Engineering	9
Administration in Action (27)	Departmental Administration	21
	Local Autonomy	6

*All the Tables (1 to 4) taken from the Report on Administrators Training of the Japanese Government for the Fiscal Year of 1967 issued by National Personnel Authority, The Institute of Public Administration, Japan.

The "B" Course (156 *hours*)

Kind	*Subject*	*Hours*
Administrative Management (27)	General Principles of Administrative Management	9
	Organization Management	3
	Personnel Management	6
	Office Management	9
Law (30)	General Principles of Legislation	3
	The Constitution	9
	Administrative Laws	6
	The Civil Code	9
	The Criminal Code	3
Kind	*Subject*	*Hours*
Economics (36)	General Principles of Economy	15
	Economic Structure	6
	International Economy	3
	Economic Planning	3
	Fiscal Policy	6
	Monetary Policy	3
Political and Social (21)	International Politics	3
	Population Problems	3
	Wage Theory	3
	Social Policy	6
	Labour Problems	6
Science and Technology (15)	Introduction to Science and Technology	6
	Introduction to Natural Resources	3
	Atomic Energy—Electronic Engineering	6
Administration in Action (27)	Departmental Administration	21
	Local Autonomy	6

TABLE 2

OUTLINE OF ADMINISTRATIVE TRAINING FOR LEVELS OF DEPARTMENTAL BRANCH CHIEFS CONDUCTED DURING 1967

(1) GENERAL LECTURES :

Section 1—The "A" Course (135 hours)

Area	*Subject of Study*	*Hours*
Administrative Management (27 hrs.)	General Principles of Administrative Management	3
	Introduction to Administrative Management	6
	Organization Management	3
	Personnel Management	3
	Introduction to Human Relations	3
	Office Management	3
	Operations Research	3
	PERT	3
Law (6)	The Constitution	6
Economics (36 hrs.)	National Income	6
	Economic Structure	3x
	Economic Structure	3x
	International Economy	3
	International Finance	3
	Economic Planning	6
	Fiscal Planning	6
	Monetary Policy	3x
	Monetary Policy	3x
Politics and Social (21 hrs.)	International Politics	3
	Population Problems	3
	Wage Theory	3
	Social Policy	6
	Labour Problems	3
	Labour-Management Relations in Public Service	3

Area	*Subject of Study*	*Hours*
Science and Technology (18 hrs.)	Introduction to Science and Technology	6
	Introduction to Natural Resources	3
	Electronic Engineering	3
	Atomic Energy	3
	Computer	3
Administration in Action (30 hrs.)	Departmental Administration (*vide* Section 3 below)	24
	Local Administration	3
	Local Fiscal Administration	3

Note : Items marked x are given by different lecturers.

Section 2—*The "B" Course* (156 *hours*)

Kind	*Subject of Study*	*Hours*
Administrative Management (27 hrs.)	General Principles of Administrative Management	6
	Introduction to Administrative Management	3
	Organization Management	3
	Personnel Management	3
	Human Relations	3
	Office Management	3
	Operations Research	3
	PERT	3
Law (30 hrs.)	General Principles of Legislation	3
	The Constitution	9
	Administrative Laws	6
	The Civil Code	9
	The Penal Code	3
Economics (36 hrs.)	General Principles of Economy	15
	Economic Structure	3
	Economic Structure	3

Kind	*Subject of Study*	*Hours*
	International Economy	3
	Economic Planning	3
	Fiscal Policy	6
	Monetary Policy	3
Politics and Social (21 hrs.)	International Politics	3
	Population Problems	3
	Wage Theory	3
	Social Policy	6
	Labour Problems	3
	Labour-Management Relations in Public Service	3
Science and Technology (15 hrs.)	Introduction to Science and Technology	6
	Introduction to Natural Resources	3
	Electronics	3
	Atomic Energy	3
Administration in Action (30 hrs.)	Departmental Administration	24
	Local Administration	3
	Local Fiscal Administration	3

Section 3—Departmental Administration—Both the "A" and "B" Courses (21 hours)

Subject	*Hours*
The Present State of Over-all Land Development and Its Problem Areas	3
Modernization of Education	3
Various Problems of Japan's National Security	3
Problem Areas of Japanese Agriculture	3
Transportation Administration	3
Liberalization of Capital	3
City Planning	3

(2) SPECIAL LECTURES :

Section 4—The "A" Course (42 hours) (Objective—High Vision)

Subject	*Hours*
Management of A Talk	3
How to Appreciate Fine Arts	3
The Japanese and Religion	3
The Present-day Life and Stress	3
International Affairs	3
Japanese Literature	3
A General Survey of Japanese Plays	3
Analysis of Business	3
Characteristics of American Society	3
Exploration of Space	3
Civil Engineering	3
Self-Conscious Love of Nature	3
My Random Thoughts on Management	3
In Re Understanding of Music	3

Section 5—The "B" Course (45 hours)

Subject	*Hours*
Management of A Talk	3
The Japanese and Religion	3
The Present-day Life and Stress	3
International Affairs	3
Public Hazards	3
The Ancient Fine Arts of Pompeii	3
Will and Creativeness	3
Japanese Plays	3
How to Read Chinese Literature	3
Analysis of Business	3
Characteristics of American Society	3
Exploration of Space	3
Self-Conscious Love of Nature	3
My Random Thoughts on Management	3
In Re Understanding of Music	3

(3) SEMINARS :

Section 6—Exercise in Tasks for the "A" Course (81 hours)

Subject		*Tasks*	*Hours*
Administrative Management		"What the Planning Department or Section Should Be ?"	15
Law		"What the Fundamental Human Rights Should Be ?"	15
Economics		"Fiscal and Monetary Policy for Stable Economic Growth."	15
Social Policy		"Japan's Minimum Wage System".	15
Elective Subjects	(1st Syndicate) Foreign Policy	The Future of Japan's National Security.	
	(2nd Syndicate) Development Administration	"What Should be the Traffic in A Mammoth City ?"	21
	(3rd Syndicate)	"Manpower Development and Special Education for the Talented in the Age of Technological Innovation".	

Exercise in Tasks for the "B" Course (66 hours)

Subject	*Tasks*	*Hours*
Administrative Management	"How the Management Should Adjust Itself to Changed Circumstances ?"	15
Law	Does the Prohibition of Multi-Term Elections of Governor Violate the Constitution?	15
Economics	Discuss the Problems of Economic and Social Development Plans (Fiscal 1967 to Fiscal 1971)	15

Subject		*Task*	*Hours*
Elective Subject	(1st Syndicate) Social Policy	How to Cooperate in Development of Southeast Asia?	21
	(2nd Syndicate) "Agriculture and Forestry" Policy	"What Our Dairy Farming Policy Should Be?"	
	(3rd Syndicate) "Science and Technology" Policy	Technological Innovation in the Wake of Capital Liberalization—centering particularly around Research Investment.	

Section 7—Exercise in Administration and Management for "A" and "B" Course Mixed (48 *hours*)

Subject	*Hours*	*Task*	*Remarks*
Case-Study (1)	3	Case used: "A Certain Day's Branch Chiefs' Meeting".	Case used in J.S.T.' Continuative Cours (Leader is a Research Division staf member)
Case-Study (2)	3	Case used: "The Efficiency Branch and the Production Branch".	Case used in J.M.S.' (Leader is a trainee)

* J.S.T. stands for National Personnel Authority-developed Supervisory Training.
† J.M.S. stands for Japan Management School.

Subject	*Hours*	*Task*	*Remarks*
Study of Administrative Operations	9	Case used: "Yagisawa Dam".	Case developed i this Institute wa used.
Reading Study Ist (Administrative Management)	6	Book used: "Bennedy" and two others. Discussion Task: As a future executive in public service.	

Subject	*Hours*	*Task*	*Remarks*
2nd (Organization Management)	6	Book used: "How to Proceed with Improvement of Organization?"	
3rd (Personnel Management)	6	Book used: "The Practice of Management."	
Management Game	9		Management Games developed by the Research Division of the Institute are used.
Study of Judicial Precedents (for "A" Course only)	6	Case of A Request for Cancellation of Decision on Purchase of Farm-land.	

TABLE 3

SPECIAL LECTURES—SUBJECTS OF SEMINARS AND HOURS FOR THE ADMINISTRATIVE TRAINING FOR LEVELS OF DEPARTMENTAL BRANCH CHIEFS IN FISCAL YEAR 1967

"A" Course (132 *hours*)		*"B" Course* (108 *hours*)	
Exercise in Set Tasks		*Exercise in Set Tasks*	
Compulsory subjects	*Hours*	*Compulsory subjects*	*Hours*
Administrative Management	15	Administrative Management	15
Law	15	Law	15
Economics	15	Economics	15
Social Policy*	15	Elective Subjects*	21
Elective Subjects†	21		
*Deleted in 1968 and put under Elective Subjects			
†Increased to 56 hours		*Increased to 56 hours	
Exercise in Administration and Management		*Exercise in Administration and Management*	
Case-Study	6	Case-Study	6
Study of Administrative Operations	9	Study of Administrative Operations	9
Reading Study	18	Reading Study	18
Management Game	9	Management Game	9
Study of Judicial Precedents of Administrative Cases*	9		
*Deleted in 1968 and put under Elective Subjects			

(a) Study of Tasks	27 hours (for both "A" and "B" Courses)
(b) Writing of Essay*	18 hours (for both "A" and "B" Courses)

*Transferred to Elective Subject.

TABLE 4

CONTENT OF ADMINISTRATIVE TRAINING FOR DEPARTMENTAL ASSISTANT SECTION CHIEFS IN FISCAL YEAR 1967

(1) Lectures (including discussion)—33 hours (increased to 37 hours in 1968).

Subject	*Number of Hours*
Politics and Administration	3
Development Administration	3
International Affairs	3
Problem Areas of Japan's Economy	6
Employment Problems	3
Labour-Management Relations	3—5
Science and Technology	3
Philosophy, history, health, arts, etc.	9—11

(2) Seminars—75 hours

Subject	*Number of Hours*
Exercise in Tasks (International relations and economics)	24
Study of Judicial Precedents	9
Case-Study	3
Study of Administrative Operations	9
Reading Study (Administrative Management, economics)	15
Exercise in Evaluation	6
Symposium (Desires about administration)	6
Panel discussion (Current topics)	3

(3) Others—27 hours (increased to 39 hours in 1968)

Subject	*Number of Hours*
Individual Study	12—14
Study Tours	6—12
Orientation, Roundtable Conference	9—13

PERSONNEL ADMINISTRATION—TIME FOR ACTION

Bipin Chandra

THE publication of the Report of the Administrative Reforms Commission on Personnel Administration has given a new lease of life to the controversy between the Generalist and Specialist schools of thought in public Administration.

The Generalist View

The case for continuance of a form of administration dominated by the elite cadre of Generalists, is lucidly summed up as follows:[1]

> "... the assumptions behind the All India Service concept, which are valid even today, were:
>
> (*a*) the usefulness of a district experience for development of qualities of co-ordination, human understanding and man management, which are an asset for performing the secretariat functions of policy-making and co-ordination;
>
> (*b*) early experience at sub-divisional and district levels in exercising choice between competing claims, which is useful in the secretariat where constraint of resources involves high selectivity;
>
> (*c*) early legal training as magistrates and revenue officers, which again is of advantage in the secretariat where Constitution has to be kept in view, laws have to be framed, rules and regulations prepared and parliamentary work of the Minister attended to;
>
> (*d*) actual participation in the total tasks of development at district level which helps build the right perspective for a meaningful contribution at the headquarters where such schemes are planned and projected;
>
> (*e*) the feeling of belonging to an elite, which has a direct stake in the integrity and development of the country."

[1] M. K. Chaturvedi, "Personnel Administration : The Need for Realism", *Indian Journal of Public Administration*, Vol XV, No. 1, January-March, 1969.

The Specialist Plea

The Specialist's plea almost a *cri-de-coeur* runs thus:[2]

"The present system of administration was designed by the British primarily for performing the regulatory functions of a Government. After the attainment of independence, the functions of the Government have changed considerably. Government has in increasing measure assumed an entrepreneurial role and is responsible for comprehensive social and developmental activity. Administration has thus evolved into management. It involves, for example, the determination of priorities, the allocation of men, money and materials among different sectors of economy, the appraisal of projects, the control of corporate public enterprises. The existing personnel policy and service structure are not conducive to the development of the skills and dynamism and capacity for leadership that these new functions of Government require.

"The British needed a body of loyal and contented civil servants to man the empire. The present structure of services is thus based on the concept of an 'elite cadre' and seeks to constitute a governing class of civil servants to whom all other cadres shall render only supporting services and assistance. It is based on a philosophy of platonic guardianship. This concept is obsolete. It is repugnant to a democratic and egalitarian society that we are resolved and committed to build.

"The present system assumes that the administration of a district is the most appropriate "grass-roots" experience that can prepare an officer to assume all higher managerial responsibilities. Such experience is really no substitute for expert knowledge and has, in any case, little relevance to many spheres of administration such as the preparation of the budget, the formulation of tax policies, the promotion of exports, the appraisal of industrial projects, the development of transport and communication systems. These require long familiarity with the subject and experience in related fields.

"The present practice of manning all the senior managerial positions in the Government almost exclusively by officers belonging to the 'elite service' has resulted in lack of professional competence required for handling the functions of the present day Government. The Central Services, both technical and non-technical and the functional All India Services have been relegated to a supporting

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[2] Memorandum submitted by some of Central Class I Services Associations to the A.R.C.

and subordinate role in the Administration. Officers belonging to these services have no normal expectation of participating in higher management. They are afforded little opportunity to develop managerial competence to the fullest extent. This has inhibited the growth of a feeling of involvement and a sense of participation in the developmental process. It has prevented departments from evolving into effective instruments of social and economic change.

"Another facet of this undue dominance of one service is the inevitable tendency, whether conscious or unconscious, to keep down the levels of remuneration in field appointments, which officers of that Service are not likely to hold, like, for example the Commissioner of Income Tax, the Post Master General, the Chief Engineer of P.W.D., or the Accountants General who were, earlier, broadly equated in terms of emoluments, as well as status with the Commissioners of Divisions in States and Joint Secretaries at the Centre. A recent example of this tendency is the upgradation of the super time-scale of the I.A.S. It has unduly inflated the importance of the secretariat jobs with consequent drift of talent away from the field. It has resulted in erosion of the importance of the field job to the detriment of the implementation of Plan Programmes."

The two points of view brought out above have been presented respectively by those who would stand to benefit if their arguments were to gain acceptance. They, perhaps, reveal what the ARC report laments as a pre-occupation with service conditions and emoluments and prospects of promotion and may possibly be regarded as lacking in the objectivity which is essential in considering the desirability or otherwise of reform. But it should be possible to consider dispassionately as to what type of administrative structure is required for the tasks of the future. What then are these tasks?

The Aims of Government

The aims of our Government are enshrined in the Directive Principles of the Constitution, which though not enforceable in a Court of Law, are "nevertheless fundamental in the Governance of this country". The basic directive is: "The State shall strive to promote the welfare of the people by securing and protecting, as effectively as it may, a social order in which justice, social and economic and political, shall inform all the institutions of national life."[3]

[3] Constitution of India, New Delhi, Government of India, Article 38.

The strategy of economic planning was adopted in 1950 "to promote a rapid rise in the standard of living of the people by efficient exploitation of the resources of the country, increasing production, and offering opportunities to all for employment, in the service of the community". In 1954, the Parliament adopted the Socialistic Pattern of Society as the objective of economic policy and, to that end, directed that economic activity in general, and industrial development in particular be stepped up to the maximum extent possible.

The Task

The administrative machinery has, therefore, to address itself more purposefully to the great task of bringing about an "orderly transformation to a socialist, secular, industrial society, deliberately and with the utmost speed."[4]

Planner's View

Referring to the administrative structure, the Draft IV Plan document states:[5]

> "Implementation of plans is intimately associated with better organization and operation of the general administrative machinery. It is not proposed to deal with these matters here largely because the Administrative Reforms Commission is passing them under review in detail and a large number of its recommendations are under the consideration of Government.
>
> "Attention may, however, be called to two broad aspects of special importance to planning. The first is the need to incorporate in our administration, including that of the public undertakings, the technician, the specialist and the expert in an appropriate manner. The structure of the older organization and its line of command were inevitably constructed round the generalist administrator. This has to undergo modification in that the specialist, the technician and the expert have to be enabled to make their contribution in a responsible manner at all levels of administration.
>
> "The other aspect is that of inducing in the expert or the technician a proper appreciation of the administrative and economic aspects of the problems that he handles. Unless the expert or the technician begins to work at problems of Plan formulation and implementation, not chiefly from the point of view of feasibility

[4] Convocation Address, Indian School of Public Administration, New Delhi, 1966.
[5] Fourth Five Year Plan (Draft), New Delhi, Planning Commission, April, 1969.

of technical performance or optimum technological requirements but from the point of view of what could be the best arrangements under given administrative and economic constraints, his contribution to planning would not be very effective. It is possible that putting the technician or the expert in more responsible administrative positions might itself help in making progress towards the latter objective."

The need, therefore, is for an administrative structure which is task and performance-oriented, rather than one dedicated to maintaining the peace and preserving the *status quo*. Such an administration calls on the one hand for personnel in the field skilled in their particular functions—be they the building of roads and bridges, the collection of revenues or the operation of the railways—motivated by satisfaction in their work and their prospect of a career, and trained in the art of man-management and leadership. On the other hand, (we require groups of men, each specialist in a particular field, contributing their expert knowledge to the formulation of policy. In such a structure there can be no pre-eminent speciality—still less a pre-eminent cadre. Managerial ability in the field is the quality of leadership, developed in individuals to lead men to perform their allotted tasks in their respective areas of work. In policy making, it is the ability of the specialist to rise above his speciality to a comprehension of all related factors involved in the tasks which confront the group with which he works.

Rationale of A.R.C.'s Recommendations

Keeping these considerations in view, the ARC's recommendations provide for: [6]

"(*i*) A rational system of filling policy-advice positions with men possessing the required qualifications and competence needs to be devised. This will mean a fuller use of different Services for Secretariat work, as also the adoption of special measures to build the needed specializations in the headquarters personnel.

(*ii*) Senior management will need to be selected from all the relevant sources—generalist and specialist—and, for this purpose, talent needs to be discovered and developed in all the cadres, specially among those who have not hitherto been inducted into the higher administration to any significant degree.

[6] Administrative Reforms Commission, *Report on Personnel Administration*, New Delhi, Government of India, 1969, Chapter II, para 25.

(*iii*) A rational pay structure needs to be adopted so as to reflect actual responsibilities borne in each job.

(*iv*) In order to tone up morale throughout the personnel system much greater scope than now exists needs to be created for talent in the lower ranks to move up to higher positions in the Civil Service, on the basis of competence and performance."

The diversification in Government function underlines the need for specialization and more purposeful training. The increasing demand for good administrators in larger numbers in the face of attractive opportunities outside Government underlines the need for casting the net wide and selecting the best from all available sources. The need to keep morale high underlines the necessity of a rational pay structure based on job evaluation; and the need to relate progress to performance and promotion to merit requires short pay grades, an objective system of assessment and appropriate methods and impartial machinery for selections for higher jobs.

All these principles, if put into practice, should lead to the right man manning the right jobs—and this is the crux of the matter.

The Generalist's Reaction

The generalist's reaction to the ARC Report is :[7]

"As one goes through the Report and reaches the end, one perceives a persistent undercurrent of a single theme running across; it is to diminish and circumscribe the role of the Indian Administrative Service in the personnel structure of the country and to buttress and augment the role of the uni-functional non-technical and technical services.

"The Commission's handiwork lies in so arranging a series of recommendations that the cumulative result would be:

(*a*) migration of talent from IAS to other uni-functional Services like Income-tax, Audit, Postal, etc., and

(*b*) progressive reduction of senior jobs to which IAS officers would be eligible."

Validity of the Generalist's View

These complaints and particularly the one that the acceptance of

[7]M. K. Chaturvedi, *op. cit.*

ARC's recommendations would result in a drift of talent away fron the IAS, appears to be an unduly Service-oriented view; because, wha would be the loss of one Service would be the gain of other Service which are equally parts of the Public Administration system. The im plementation of ARC's recommendations will no doubt mean som shift of talent away from the district jobs, but in the context of th intellectually challenging jobs thrown up in the vast new areas o developmental activity, particularly in the sectors of economic and in dustrial administration under the Central Government, this is not merel desirable but an urgent necessity. Some of the brightest young me need to be taken into these sectors and trained to meet the new challen ges, instead of unduly stressing the need and sufficiency of grass-root experience which is of less, even doubtful, relevance for the performanc of their new functions.

Accepting that the "grass-roots" touch is necessary at the highe levels of administration in all fields, it is no longer necessary to prepar all our top administrators in the crucible of the districts. In the colc nial period, grass-root experience by district administration was c great importance not only because of their pre-occupation with la and order as the main objective of administration but also because th was the British Government's only means of contact with the subje people and of understanding their grievances and requirement Today we have the elected representative of the people—a man of broa experience and sound commonsense with a true appreciation of tl needs of the common man—at the very top. It is he who provid the Generalist moderation based on grass-roots knowledge. He do not require another generalist in support, who in his turn, is backed t the relevant specialist. That is an arrangement which is expensiv dilatory and leads to diffusion of responsibility.

Neglect of the District

The present strength of the IAS cadre is about 3,000 whereas tl number of districts is around 300. Any scheme of job rotation for su a large number of officers in this limited number of posts cannot pr vide adequate district experience at different points of career to ea of them. The result is that the officers will have only a smattering district experience, the average tenure even now having been work out in a recent study as one year and eight months. It cannot, ther fore, be claimed that IAS officers are especially qualified to hold all t top positions by virtue of their district experience. If it were so, simil short-spells of district experience can be made available to the office of all the Services. The proper course is to have a closely-knit distri

based service on the French pattern which will mainly cater to the district administration and such other functions at senior management levels to which district experience has special relevance. Only in such a set-up can the district administration be given the sustained and much needed attention that it deserves. It should also be borne in mind that seniority and long pay-scales which characterize the present district-based service tend to discount actual performance, as a relevant factor for advancement and fail to take into account the inherent differences in individual capacities for development as well as deterioration.

Another argument advanced to justify the monopoly of top management positions and superiority of service conditions for the district-based service is that those personnel belonging to that cadre have been adjudged the most meritorious in an open competitive examination and, therefore, the service embraces the best talent available in the country from time to time. This has to be considered in the light of the fact that the present system of examination almost exclusively caters to graduates in the Humanities and Pure Sciences. It tends to ignore the existence of considerable talent to commercial, scientific, and technological fields. Again, there is nothing in the scheme of examination to adjudge the candidate's aptitude for any particular service or department. In any case an examination conducted at an early age of 21-24, cannot in reason be depended upon finally and conclusively, for all time to come, to determine the candidate's suitability for all the multifarious positions of higher responsibility under the Government.

ARC's Solution

The ARC's scheme of functional cadres having equal status, a unified grading structure and comparable career prospects, is intended to overcome these serious drawbacks and suggests that after initial recruitment, functional expertise should be developed systematically and those showing a distinct flair for management in its widest connotation, should be selected through an appropriate process of assessment for being groomed and trained for middle as well as top management positions.

Gaps and Inconsistencies

Some gaps and inconsistencies, however, call for comment in the ARC's recommendations. While recommending recruitment for a

number of non-technical services on the basis of a single recruitment examination which is primarily a test of academic calibre, it has been suggested that the allocation to the different services be made on the basis of position and preference. Once a unified grading structure and comparable career prospects with equality of opportunity for reaching the highest position are assured, the allocation can better be made on the basis of aptitude as assessed and adjudged after the initial period of common training. This would not only redress any undue shift to or away from particular services but also reduce the number of misfits. It should be possible to identify particular qualities which are important in particular service or groups of services and after the initial period of common training, select persons who show the greatest evidence of possessing those qualities. Again, while the need for specialization at the earlier stages of the career has been duly stressed, the fact that allocation to a particular specialism or selection to the policy and managerial pool, should have relevance to the function and the background of the selected officer has not been specifically suggested. An engineer, for example, could more usefully develop his managerial functions in the field of industrial administration, the doctor in social administration, and the accountant in financial and economic administration. There is no need for rigidity; there are sectors such as defence or trade where there is scope for every specialist. But the process of selection should be so devised that the relevance of functional specialization to the management sector is taken into account. In recommending open tenures at senior management level, the fact that it would mean anything from 10 to 15 years at the Secretariat with consequent loss of living awareness of the problems in the relevant functional fields seems to have been ignored. On the other hand, under a system of limited tenures, the functional cadres would benefit greatly by the services of persons whose horizons have been widened by experience and participation at the policy formulation and managerial levels. The need for introducing the merit principle for selection to the middle and senior management level has been recognized, but the association of two senior Secretaries to the complete exclusion of the Heads of the functional Services seems to have been recommended without taking into account the monopoly which one particular service enjoys and will, by force of circumstances, continue to enjoy for some time.

Thus, while there is ample scope for careful examination of details, the basic principles underlying the recommendations of the ARC, seem to be unexceptionable.

Need for Implementation

The process of implementation is bound to appear to be bristling

with difficulties. In regard to the recommendation on job evaluation, for instance, work standards will have to be evolved to compare jobs in totally unrelated fields. Again, for the selection of men for the management and policy pool on the basis of an examination—tests to assess aptitude, capacity and potential for management as well as policy formulation will have to be devised. These are, however, by no means insurmountable. In regard to first, for example, one bench mark can easily be established at the stage of recruitment by competitive examination and the other at the level of the Heads of Department who should be not more than one level below the Secretary in terms of status and emoluments. Some work on similar recommendation made by the Fulton Commission in regard to the administrative structure in the U.K., has already begun there. There is no reason why the salutary recommendation should be more intractable in this country than elsewhere, given the ready acceptance and the purposeful direction necessary.

The Government would, therefore, do well to proceed with the implementation of the recommendations without being inhibited by the difficulties which are to be faced in the process. For this, as Shri C. D. Deshmukh said the other day,[8] there must be "an acceptance of moral responsibility" by the Prime Minister at the Centre and the Chief Ministers in the States for the implementation of these reforms and "a great care needs to be taken, especially in the initial stages in selecting the key staff or senior management" for this purpose.

Time for Action

No less a person than the Chairman of the ARC has expressed the apprehension as follows :[9] "The reforms we have recommended are bound to raise resistance from those who are adversely affected. Resistance from within the services is a very difficult problem for the Government to deal with. The declarations made from time to time by the Prime Minister and other Cabinet Ministers have emphasized that reforms of a fundamental character are needed. Resistance based on sectional or personal interests should not be allowed to come in the way of putting them into effect. After all, Government service is primarily meant to serve the people and not the Government servants as such."

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[8] Address at the IIPA, New Delhi, on 9th March 1968.

[9] Administrative Reforms Commission, *Report on Personnel Administration*, Para 12 of ARC Chairman's letter to the Prime Minister forwarding the Report.

It is now time for the Government to demonstrate, by its choice of officers for the new department of personnel and by the location of this department, that it is firmly committed to a programme of reform in Personnel Administration.

COMMENTS

(In this feature we give comments received from the readers on the articles published in the previous two issues of the Journal. The comments should be critical and thought-provoking, and should be confined to the major points made by the author, inadequacies in his reasoning or data, or any new solution to the problem which suggests itself to the reader. They should not normally exceed 1,500 words.—Ed.]

PERSONNEL ADMINISTRATION*

The two articles on the ARC Report on Personnel Administration appearing in a recent number of the Journal (Butani: A muffled cry for change; Chaturvedi: Need for Realism, Journal of Indian Institute of Public Administration, Vol. XV, No. 1, pp. 11-74) make interesting reading as providing two perspectives on the same subject. While Shri Butani generally approves the ARC Report as a landmark in the history of administrative reform, he is somewhat concerned that the cry for change is not as full throated as he would have liked; Shri Chaturvedi, on the other hand, feels that the Report is based on assumptions of doubtful validity, abounds in contradictions and suffers from major omissions.

Before one attempts to synthesise to some extent the thesis and antithesis of the two articles, it may be useful to highlight some of the major points of accord and dissent between the two writers. Both Shri Butani and Shri Chaturvedi agree with the ARC Report that there is a need for change to improve the falling standards of administration. Both are agreed too that efforts must be made to attract the best talent available to the administrative cadres—and this should be as widespread as possible. There is also a general agreement on the need for greater specialisation—or "professionalism", if you will—in administration to meet the needs of the complex society of today. Finally, it is agreed that a careful job-analysis should be undertaken by a competent agency so that, in the words of Shri Butani, "each job gets the man best fitted to hold it".

Where Shri Butani and Shri Chaturvedi differ is in the remedies proposed —the former generally approves the ARC recommendation to "de-emphasise" he role of the IAS so as to bring it on a par with the other "specialist" services o all of whom the middle and higher managerial posts will be thrown open, he IAS itself being allotted the specialised field of Land Revenue and Magisterial control. Shri Chaturvedi, on the other hand, would retain the raditional concept of an elite corps of administrators (by whatever name t is called) but make entry into it possible through an examination for at east 50% of the higher managerial posts. In other words later entry to he IAS will be relaxed but the Service itself will remain the spinal cord of he administration.

*Two articles on this subject by Shri K. N. Butani (*Personnel Administration—A Muffled Cry for Change by the Administrative Reforms Commission*) and Shri M. K. Chaturvedi (*Personnel Administration—The Need for Realism*) were published in the Journal in Vol. XV, No. 1 (Jan.-March), 1969.

The other differences between the two stem out of this basic disagreement: Shri Butani approves a uniform pay structure for all services, identification of areas of specialisation to which each one is allotted and functional approach to staffing. Admittedly, he has some doubts whether the areas of specialisation have been well demarcated in the ARC report and whether there may be practical difficulties in reversion to parent cadres; but he has no doubt that a "generalist" initially recruited on his knowledge of Blue Beard's six wives cannot be given a role of primacy in administration. Shri Chaturvedi, on the other hand, regards the expertise gathered by an IAS Officer during his field tenures as having a direct relevance to the management problems at higher levels of administration—which cannot be substituted by specialisation.

Perhaps, there is some semantic difficulty in such discussions: Words such as 'generalist', and 'specialist', 'amateur' and 'professional' 'policy' and 'field experience' are all loaded with individual value judgments that it is sometimes impossible to speak of them on the same wavelength. For instance, the common application of the teams—generalist or amateur to a seasoned member of the IAS seems to be inappropriate. If a member of the IFS is a diplomat, a member of the Economic Service an economist, a member of the IAS is an administrator in as fully a professional sense as any one of the other services. If he does not speak in an esoteric language, as some of the other professions do, it is because he, more than in any other service, deals with the common people particularly in rural and semi-urban areas; though one must add that even this deficiency (?) of a distinctive jargon is rapidly being made up through numerous Seminars and Conferences. But to call professional administrators who have spent 10 or 15 years in varied assignments calling forth mature human skills a "mere amateur" and then to argue to 'do away with them' because what we need today are professionals, seems to be too much like giving the dog a bad name and then hanging it.

It is, perhaps, time that an administrator in the true sense is recognised as a specialist, or a professional as much as a doctor, lawyer, or economist. What is, in fact, needed today is greater "professionalism" in administration—not in the sense of inducting doctors and technicians into that field but a greater expertise in selected areas of administration—many of which have become important only in the last 20 years. If the ICS in the pre-independence days was largely dealing with land revenue and law and order, it was because that was primarily what the government were concerned with in these days; though, after the Montford reforms of 1920, increasing attention was paid to nation-building activities such as Education, Health, etc; but certainly there was little of development planning and none of the economic activity which has become so important now. For effective administration these areas to be adequately administered, there is need for a corps of administrators who, although not specialists themselves, are able to comprehend them in discharging their traditional role of advising popularly elected ministers in policy making. To quote the Fulton Report on Civil Service reform in U.K.: "The Administrator does not replace the specialist but has a more meaningful relation with him than in the past." (p. 52)

Such a "professionalism" in administration can come about only through a wise and well administered Career Development Programme under which

each person is assisted after an initial period of 8-10 years, to choose an area of specialisation depending on his aptitudes, and background, and encouraged to remain in that field, gathering experience and skills that would enable him to play an effective role. Such a person working, for instance, in the field of Health Administration cannot and will not replace a doctor; what he can do, however, is to attain a keener insight into the problems of the health administration than what he would probably have if he had been flitting from post to post in diverse fields.

Perhaps, one of the invisible difficulties in this argument is the unconscious primacy society has accorded in the past to an administrator both in status and pay. While from a monetary point of view, many other professions are today much better paid than those of an administrator, there seems to linger in the country an exaggerated sense of importance of the role of the administrator, mostly by those who call themselves as "specialists" and feel somewhat aggrieved that they are being kept out of the inner citadels of decision-making. As Shri Chaturvedi has pointed out, this is, certainly, not the case today; any specialist is heard, and heard with respect, in the fields in which he has proven competence. If one may say so, administrators are far more receptive to specialist opinion than specialists themselves are from their junior colleagues or from other specialists. It is time however that this somewhat "old fashioned" anxiety to be a policy adviser in the secretariat should give way to a more rational and logical scale of importance of the several jobs. One may add that within the IAS itself, there is need for a greater importance to be attached to field jobs than those in the secretariat; and it is the same in other services—whether Engineering, Health or Education. Perhaps, a detailed job analysis, as is suggested in the ARC Report will help to provide a more rational perspective to the relative roles of policy and field jobs.

One must recognise that each of the "specialist" (or as Shri Chaturvedi prefers to call uni-functional) services has an important role to fill; the IAS is only one amongst them, and has its own role which has been handed down for more than two centuries. That due to historical circumstances it is 'primus inter pares' cannot be denied even by its critics; on the other hand, the new, and not-so-new specialist services have a distinct and equally important job to do. But it seems to be wrong to confuse their roles and to insist that the roles of the services must be interchangeable. The suggestion of a lateral entry into the administrative cadre does provide for the infusion of new blood into the service which is all to the good; but whether a greater fusion is possible without detriment to the "professionalism" in the services themselves seems to be doubtful. Certainly, discrepancies in status or even monetary emolument (except as are based on a job analysis) should be minimised or abolished; but the effect of the ARC recommendation would be to make the IAS itself into a spineless body, pale shadow of the group lauded by Sardar Patel and Dean Appleby. Perhaps, a more honest course would be to abolish the service all together though what impact this would have on the centre-state relations is for each to speculate; but if the IAS is to perform the coordinating role which has been handed down to it from the ICS and re-assigned to it in 1948, it must be reformed but on somewhat different lines than those envisaged in the ARC report.

In a well-intentioned spirit of anxiety to introduce reforms, it would be a mistake to give up some of the basic and tried features of the present

system which have withstood the test of time and tradition. For instance, in some of the States, in the over exuberance of democratic decentralisation, the prestige of the post of District Collector was corroded only to find that administration at this vital level was in danger of losing its focus and effectiveness. In fact, in recent years there has been a reverse trend in many states of strengthening the position of the collector to provide a sense of coordination for the development work in the district.

That the civil service has served the country well in the troublous post-Independence era will hardly be doubted in spite of its admitted shortcomings, it provided this country with a team of administrators who in maturity, wisdom and skills were equal to the best any country could offer. If today the country has survived the strains of a partition, two border wars and has simultaneously undertaken a massive planning effort, a portion of the credit must go to the civil service. That it must be improved to function more effectively in future will be readily admitted; but is it wise or desirable to so emasculate it as to render it almost useless.

To give only one instance: not that the flush of Independence is almost worn out, centrifugal tendencies based on language, religion, and caste are rearing their ugly heads everywhere. To these must be added, as the Telengana affair is a pointer, the potentially dangerous problem of regional imbalances. All these introduce new discordant features in the country which would make orderly administration progressively more difficult, if not impossible. It seems therefore doubly important to have a body of administrators who would be trained to take an objective view of the problems and develop an All-India oulook that would serve to bring the country together in some degree. Many of the inter-state problems which figure so prominently in the daily press might well be solved with greater ease if left to officials who are trained to possess an objective and non-partisan attitude in such matters. It would be a great pity for the country if a system which can provide such a signal service to the country is de-emphasised or downgraded under a mistaken notion of equality.

Finally, it may be said that the ARC report did well in underlining the need for a change in the present pattern of administration to meet the complex needs of the country. It was also right in emphasising "specialisation" as a necessary pre-requisite for success; it correctly regarded job analysis as an important function for an independent personnel agency which should also operate a Career Development programme that would serve some of the objectives. There is great merit in its proposal to have a Second 'proving' test in the middle of the Career for eligibility to higher managerial posts. But it seems to have erred in not recognising the continued utility of a professional administrative cadre—broader based, if necessary, than the present—whose varied experiences at the subdivisional, district and state levels provide the highest policy making levels with a profound insight into the problems of rural India. This is not to deny the importance of other 'specialist' and 'technical' services; but the ARC report in its anxiety to equalise, has, one fears, not appreciated adequately the stabilising influence the Civil service has provided in the past and is likely to provide in the stormy times ahead.

—RAM K. VEPA

INSTITUTE NEWS

The Institute suffered a grievous loss in the passing away on May 3, 1969 of Dr. ZAKIR HUSAIN, President of India. Eminent educationist and statesman, Dr. Zakir Husain touched many institutions in many ways. Then Vice-President of India, he presided over the annual day of the Indian School of Public Administration in July 1962 and delivered the convocation address. Despite his multifarious and important responsibilities he found time to release the IIPA prize publication "The Framing of India's Constitution" on November 26 last year.

The Institute was also grieved on the demise on June 1 of Prof. R. Bhaskaran, retired Professor of Politics and Public Administration of Madras University, a great scholar and veteran teacher of Political Science, and founder member of the IIPA. He organized the Madras Regional Branch and served as its Honorary Secretary. He was also closely associated with the activities of the IIPA.

The Institute, as the National Section of the International Institute of Administrative Sciences (IIAS), sponsored a 5-member delegation to the Round Table of the IIAS at Barcelona held from June 22 to 28. It consisted of *Shri K. Hanumanthaiya*, Chairman, Administrative Reforms Commission (Leader); *Shri N. K. Mukarji*, Joint Secretary, Ministry of Home Affairs; *Prof. G. Mukharji*, Director, IIPA's Centre for Training & Research in Municipal Administration; *Dr. B. S. Khanna*, Head of the Department of Political Science, Panjab University; and *Dr. J. N. Khosla*, Director of the Institute. The discussions at the Round Table were focussed on: (*i*) Governmental and administrative organization in the field of scientific development; (*ii*) Changes of procedures, methods and organizational structures of the administration to cope with the effects of technical progress; and (*iii*) Participation of users or directly interested persons in public administration, including national educational administration. *Dr. Khosla* acted as one of the General Rapporteurs for the last item.

* * *

The Institute organized the following courses for middle/senior level officials of the Centre, State and Municipal Governments, and Public Corporations:

1. Third Course on Performance Budgeting
   (April 6—16)
2. Second Executive Development Programme on Economic Decision-Making
   (April 17—26)
3. Sixth Course in Municipal Administration
   (April 7—May 20)
   (This course was also attended by two nominees of the Government of Indonesia under the Colombo Plan.)
4. Third Course in Budgeting and Financial Control
   (April 28—May 27)
5. Fourth Course on Performance Budgeting
   (May 26—June 3)

In addition, the Institute also organized the following Conference and Seminar:

1. Conference on Problem of Resource Mobilization (April 21)

   (The conference was attended by the Chief Ministers and Ministers of various States who were in Delhi at that time in connection with the meeting of National Development Council.)

2. Seminar on "Decentralization of the functions of the Municipal Corporation with Special Reference to the Scope for Decentralization of Policy Matters".

   (Organized by IIPA's Centre for Training and Research in Municipal Administration in collaboration with Municipal Corporation of Delhi.)

* * *

The Special Issue of the Indian Journal of Public Administration, to be published in October, 1969, would be on "Science and Government".

The subjects for 1969 IIPA Prize Essay Competition are: (1) Union-State Financial Relations; (2) Economic Development and Administrative Change; (3) Performance Appraisal in Public Service; and (4) All India Services in Union-State Relationship.

* * *

Dr. O. Glenn Stahl, former Director, Bureau of Policies and Standards, U.S. Civil Service Commission, Washington, re-joined IIPA on June 23 for a period of about three months. He would help the Institute in formulating detailed proposals in the area of "Organization and Personnel" and initiating the needed studies thereon.

* * *

Prof. William A. Robson, Professor Emeritus of Public Administration, London School of Economics and Political Science, gave a talk on "Fulton Report" on April 3. *Shri V.V. Chari*, Secretary, Administrative Reforms Commission, presided.

Dr. Derek De Sola Price, Professor of History of Science & Medicine at the Yale University, USA, addressed a group of special invitees—composed of scientist-administrators, and scientists—on "Scientific Community—its Interaction with Administration" on April 24. *Dr. B. D. Nag Chaudhuri*, Member, Planning Commission and Chairman, Committee on Science and Technology, presided.

The following lectures were arranged under the auspices of Regional/Local Branches of the Institute :

Branch & Date	*Subject*	*Speaker*
REGIONAL BRANCHES		
Punjab (March 29)	Problems of Urbanization with Special Reference to Punjab, Haryana and Delhi (Seminar)	Prof. G. Mukharji, Director of IIPA's Municipal Centre was the main speaker

Branch & Date	*Subject*	*Speaker*
Mysore (May 22)	Professionalism in Administration	Shri S. Bhoothalingam, Director General, NCAE New Delhi
Mysore (May 26)	Centre-State Relations in the Context of Planning	Dr. P. R. Brahmanan Professor of Monetary Eco mics, University of Bomb
Mysore (June 26)	Philosophy of Public Administration	Prof. T. Rauhen, Memb Mysore Public Services Co mission (Dr. V. K. Gokak, Vi Chancellor, Bangalore U versity presided)
Maharashtra (June 6)	The Problems of Administration (Group Discussion)	Shri D. S. Joshi, forme Cabinet Secretary, Gove ment of India (Shri R. S. Bhatt, Chairm Unit Trust of India presid
Pondicherry (June 13)	The Administrator and the Public	Shri M. R. Yardi, I(Additional Secretary, Mir try of Home Affairs (Shri B. D. Jatti, Governor of Pondicher presided)
LOCAL BRANCHES		
Poona (May 20)	Why Maharashtrian candidates do not fare well in IAS and Allied Services examinations and how their performance can be improved? (Group Discussion)	S/Shri P. R. Dubhas V. M. Dandekar, V. S. Mal jani, D. K. Garde a S. S. Tiniakar took part the discussion
Ajmer (June 21)	Future of State Enterprises in India (Seminar)	Shri B. D. Pathak, Gene Manager, Delhi Cloth General Mills Group, Del

New publications brought out by the Institute are: (1) *Agricultural Administration in India* by Prof. N. Srinivasan (Ed.) (Rs. 25.00); (2) *Voluntary Action in a Developing Society* by Shri V. M. Kulka (Rs. 5.00); and (3) *State Direc rates of Municipal Administrati* by Shri Mohit Bhattachar (Rs. 5.00).

BOOK REVIEWS

SPECIALISTS AND GENERALISTS; By F.F. RIDLEY (Ed.), London, George Allen and Unwin Ltd., 1968, 213 p.

Literature on the theory and practice of public administration has come a long way since the days of Weber. Specially in the recent past, the emphasis of most writings on the subject, has shifted perceptibly from efforts at mere codification and description of what already exists, to a pragmatic empiricism that aims at nothing less than an appraisal of the bureaucracy as a whole and of relating it to the health or ailment of prevailing socio-economic milieu. Inevitably the result has been controversy—lively controversy. F. F. Ridley does not, by any means, set out to add to the controversy, but aims at explaining and dissecting a major controversy of our times, *viz.*, role of the specialist *vis-a-vis* the generalist or general administrator.

The issue in the book could have been posed more aptly through the title itself, had it been entitled 'Specialists versus Generalists' instead of Specialists and Generalists. The term specialist is easily understood. He is the one who studies a particular subject or pursues a particular trade or vocation. He gets his place in bureaucracies of governments by virtue of his vocational attributes and normally he has his counterparts elsewhere. But the generalist is a name to conjure with, and a term which is yet to be precisely defined. It is the generalist in government who is in command in most countries that have an Anglo-Saxon tradition of Government with one notable exception, *viz.* America. He has largely no counter-part outside government. He does not need any particular vocational training to pursue his functions in government. In fact, he has no single identifiable function. His charge is administration itself, if that can be called a function. This is a part of the British heritage but as the author shows, the continental and the new world practice is very much different.

The French, for example, have no use for the generalist *per se* but prefer to peg him down to 4 or 5 separate areas of administration and they have no compunction in allowing the specialist to rule the roost in his own field. Witness the technical *grand corps* which jostle with the non-technical *grand corps.* (Incidentally, *grand* in French does not mean the same in English but merely signifies bigness.) Furthermore, the French have no use for generalists in the sense of the term that it is accepted in Britain. They are quite pragmatic in this matter and prefer to stream off their administrative talent into several channels.

The Americans have no patience with the controversy at all. The service appears to set its eyes on the man it wants and gets its man. No fetish is raised about the previous university pedigree such as history; classics or science/technology. Australia swings to the other end of the pendulum and places its specialists

on a pedestal in terms of pay and prospects and as such in terms of prestige. Germany exhibits of all the countries studied in this book, the closest parallel to British system but even then it does not come close enough. The preference is for the student of law because law in all its minutiae is the basis of the German polity. The social and economic structure compensates the specialist in the extra governmental spheres. And within government itself, the specialists and the generalists are closely integrated.

The book examines this variety of tradition with a good deal of perception. The study was also timely and purposive. It was commissioned in order to educate the Fulton brains trust in comparative administrative structures. It does not stop with merely presenting a series of descriptions—admirable as they are. It tries to draw conclusions. The administrative structure and the place of the specialist *vis-a-vis* the generalist is nothing immutable. There is no natural law that determines its shape in a particular environment. That a certain system exists in a particular country is a result of not only historical accident but of human whim as well. But it appears to be fairly certain that the controversy—specialists and generalists—will resolve itself on the basis of felt needs rather than on theoretical considerations. This is because all over the world the influence of the human element and the force of traditional practice are becoming less potent than the logic of economic and technological compulsions in governmental decision making. In the circumstances, the specialist has necessarily to come into his own and in the process turn himself into a generalist and co-exists with the generalist *ab-initio*. Administration that Britain and India have been familiar with will have to change and move on to a pattern which would be more akin to the French parallel.

—J. N. KHOSLA

TRENDS OF FEDERALISM IN THEORY AND PRACTICE; By CARL J. FRIEDRICH, London, Pall Mall Press, 1968, pp. 193.

"Federalism" as a means to political unity has been much in fashion since the Second World War. Despite the pessimism expressed by some of the writers that war and economic crisis, if they recur frequently, almost certainly turn federal systems into unitary states, a large number of new governments that have come into existence since then have adopted the federal form of structure. In Europe, for instance, West Germany and Yugoslavia framed constitutions purporting to be federal in form; the European Economic Community too is reckoned by some of its members as the foundation for a future European Federation. In South America, the constitutions of Brazil (1946), Venezuela (1947), and the Argentine (1949) were federal in appearance, although operated in a unitary manner. Federations were also established in Malaya (1948), India (1950), Rhodesia and Nayasaland (1953), Nigeria (1954), the West Indies (1958), and South Arabia (1959). Among the shortlived Federal experiments were, the Mali Federation (1959), the Union of Central African Republics (1960), the Arab Federation of Jordan and Iraq (1958), and Egypt, Syria and Yemen (1961). However, many of these federal political systems, despite their contemporary popularity, and especially those of the developing areas have not

always proved stable or successful. Some of them disintegrated; others have been converted into unitary political unions; while in still others like, Ghana, Sudan, Ceylon and Belgian Congo, Federalism as a form of government was rejected outright. The success of such experiments in some countries and the failures in others led many of the constitutional experts to attempt to analyze the factors, the stresses, and the strains which tend to promote or compromise the federal arrangements.

Most of the earlier studies in this direction [*e.g.* K. C. Wheare, *Federal Government* (1946, 4th ed. 1963), and B. M. Sharma, *Federalism in Theory and Practice* (2 vols., 1951)] have focussed their attention on the working and problems of the classic federal governments, particularly the United States, Switzerland, Canada and Australia. It is only in the last decade that comparative studies of more recent federations have been undertaken. One of the most exhaustive of these studies [R. L. Watts, *New Federations: Experiments in the Commonwealth* (Oxford, 1966)] contained an analysis of six of such experiments in Federal governments within the Commonwealth (India, Pakistan, Malaya, Nigeria, Rhodesia and Nayasaland), with occasional references to later federal developments in South Arabia Uganda, Kenya, and the East Caribbean. All these studies are based on the conventional approach, *i.e.*, in their analyses of the effectiveness, stability, and instability of the federal systems in terms of their constitutional and other structural framework. Abandoning the traditional approach, Professor Carl Friedrich, in his book under review, has contended that "federalism is more fully understood if it is seen as a process—an evolving pattern of changing relationships rather than a static design regulated by firm and unalterable rules." (p. 173) Such an approach, he thinks, is "particularly well suited to revealing the ongoing evolutionary nature of federalism resulting in a broader understanding of both the problems and the potential of federal systems". The present study is concerned with an exposition of this approach with particular reference to its application in many of the old and the new federal systems.

In the first part of his book, Professor Friedrich lays down a theory of federalism as process, traces its origin and development, and in subsequent chapters analyses its interactions with nationalism, social structure, and the party systems. He also examines in details many of the problems, such as delegated administration, decision-making, economic planning, the role of opposition in federal systems, and explores the future turnings of federalism as the core structure for greater international cooperation. In the second part of his study, he examines some of the specific federal systems with reference to the themes that he has outlined in the first part. The eleven case studies in this part relate to: Australia—an experiment in Federal Parliamentarianism; Belgium—Breakup of a Unitary State?; Brazil—the Contrast in the Rich and the Poor; Canada—Cultural conflict and Federal failure?; Cyprus—the Dangers of Dualism; Germany—Delegated Administration at work; India—Federalism and Cultural diversification; Italy—Regionalism and Federalism; Switzerland—Direct Popular action for Cultural Integration; United Europe—an Emergent Federal Order?; and Yugoslavia—Facade Federalism? In his concluding chapter in the third part, the author discusses the theoretical trends and future of federalism, views it as a vital and a viable system and foresees a greater need for, and turn toward,

federalism. He points out that federalism does not work when it is imposed from outside. Unless there exists what he terms as the "federal spirit", *i.e.*, a firm determination to maintain both diversity and unity by way of a continuous process of mutual adaptation, a federal order cannot last long. He thus argues that there is such a thing as "federal behaviour". It is a highly pragmatic kind of political conduct which avoids all insistence upon "agreement on fundamental" and related forms of politically doctrinaire rigidity. International groups like the German Federal Council and the Council of Permanent Representatives in the European communities are likely to develop the kind of face-to-face human relationships which make for comity. Comity is the "oil" of the complex machinery of federal regimes. All three, the federal spirit, loyalty, and comity are vital behavioural features of modern federalism. Without them, the writer rightly concludes, the federal systems become unworkable.

Within the short compass of his study, Professor Friedrich has sharply analyzed various specific issues which tended to influence the character of the selected federal systems. The eleven case studies in this respect should, I think, prove to be of considerable benefit to students of comparative politics and should also provide them with some new guidelines for further research in this area of political studies. The issues raised therein are not only peculiar to the new "immature federal systems" but are, as Professor Friedrich urges, also features of the more mature systems like that of Canada, Switzerland, and Australia. From his convincing study it is clear that the study of federalism, with reference to the basic characteristics of a written and a rigid constitution; distribution of powers between the union and the constituent units; and the supremacy of judiciary has become outdated and needs to be reoriented in terms of the dynamic factors that regulate the federal arrangements. It is also not enough to designate a federal system as "quasi-federal" or "semi-federal", for these terms do not help us to determine the actual character of a government nor do they help us to understand or evaluate their real problems. The significant problem of any federal government that emerges out is the interaction of forces that tend towards centralization and the forces that tend towards decentralization—such forces may be cultural, sociological, political, economic, administrative, religious or linguistic. A right balance between such forces really determines the character and stability of a federal government. The author justifiably points out that among such forces, factors that mould the federalizing process are of prime importance in determining the capacity of the individual units to federate. This argument *pari passu* is certainly applicable to the attainment of stable international federal organizations and ultimately the ever elusive goal of a world federal government. A federal state thus must be seen as particular applications of a recurrent form of effective organized cooperation between groups rather than a rigid framework of constitutional division of power. Written in a forthright and simple style, the book on the whole makes an intriguing reading and would be of interest even to a casual reader of modern governments. A discerning student, will, however, miss a detailed bibliography on the recent literature of federalism, which would have greatly enhanced its value. Perhaps, if the author had also included in his survey some of the countries where the federal system had failed, *e.g.*, Nigeria, the Caribbean Federation, Malaysia

and others, that would have greatly sharpened our understanding of the complexities of a federal structure. But then, this does not in any way detract from the importance of the book. The price of 54 sh. for this volume may, however, deter many intending readers from buying it.

—R. B. JAIN

MANAGEMENT OF STATE ENTERPRISES IN INDIA—A STUDY OF THE ORGANISATION AND MANAGEMENT OF PUBLIC SECTOR ENTERPRISES IN INDIAN SETTING; By RATAN KUMAR JAIN, Bombay, Manaktalas, 1967, pp. xiii+ 532.

Dr. R. K. Jain's work 'Management of State Enterprises in India' is a welcome addition to the literature available to the public on the working of the public enterprises in the country. Dr. Jain's book deals with a subject the details of which do not appear to be very widely known, in spite of much public discussion of the various aspects of the working of the public enterprises during the last fifteen years or so. A distinctive feature of the Indian development effort is the leading role assigned to the public sector as an instrument of long-term economic advance, in the context of the historical circumstances of the country. The number of the public enterprises of the Central Government has already increased to eighty-two and they involve an investment of over Rs. 3,000 crores—a very huge investment by any reckoning. Extended operation of the public enterprises on this scale and in a wide range inevitably throws up new problems of organization and management. When Government enters business certain problems of structure and relationships arise. The main problem is how "Government can organize itself to be an efficient and socially constructive entrepreneur consistently with the basic objectives of state policy?" The purposes of public enterprises react upon its form. The structure and the procedures are largely determined by the objectives for the time being relevant. The author has given a good descriptive account of the organization and functioning of the public enterprises.

An important problem dealt at some length by the author concerns the accountability of public enterprises. It is generally accepted that while a public enterprise should be free from detailed scrutiny or control on matters of daily managerial decisions, they should not be wholly immune from public accountability as regards policy. What this involves is differentiation between policy, in major matters at least, and day-to-day management and defining the aims and obligations of each enterprise. The managerial autonomy, in this sense, would not imply less public accountability, but then the accountability would not be in respect of procedures or individual actions but for the performance. This should reduce the occasion and need for intervention in their working.

The book covers a wide spectrum of problems of organization and management in public enterprises, such as those of Board of Directors, recruitment policies and practices, training for management, employees' participation and discipline, budgeting, accounting & cost control and pricing policy. The author's approach to the study of problems of organization and management of public enterprise is factual yet significantly informative. The book seems to be a product of deep, careful and patient study. There is, however,

no worthwhile analysis of trends of the system and the procedures nor of their rationale. Within this limitation, the book, it is to be hoped, will be of interest to all those who are interested in the difficult bu cinating contemporary problen management of public enterp

—M. M. M

LOCAL TAXATION IN A DEVELOPING ECONOMY; By KRIS KISHORE SINHA, Bombay, Vora & Co., 1968, pp. xi+198

In the arid field of local finance in India the author has contributed a scholarly and, at the same time, a very satisfying book. Absence of empirical investigations in local taxation by serious scholars stand in the way of compiling an all-India picture on the subject, apart from judging the suitability of particular local taxes in India under varied conditions. It is refreshing to find the author departing from the prevailing practice of repeating the existing system of local taxation in various parts of the country, but attempting to analyse the working of local taxation under conditions prevailing in a particular State. The author quite rightly advocates different strategies for local tax reform in the three tax regions of the country having centralized, semi-centralized and diversified tax structure. There is also a very useful appendix on the grant formulas emphasizing the various factors that are to be considered in the context of a development or a block grant.

The author starts his discussion with the two main theoretical strands in taxation—ability and benefit theories. The discussion is rather inconclusive, although the author shows his preference for benefit principles. It is clear from the discussion that the author's conclusions are not reached through the Musgrave process. Also, that benefit taxation is relevant for local government, due to the nature of services and its preoccupation the allocation functions, are stressed at all. This is surprisi the author mentions Hansen Perloff's book in his bibliogr Similarly, there is somewhat ca use of the term 'incidence o which does not take care of the blem of shifting and market f Due to this, his conclusions i appendix on "income incid of property taxes are open to di Again, while the author is rig emphasizing the tax characte of service charges, insufficient tion seems to have been paid to fee characteristics. It is possib a particular local service like supply and sanitation to be bot and fee financed. The justific for tagging service charges t property base is that these are p minantly tax financed so that *pro quo* is applicable only to a li degree.

The reform proposals sug by the author are basically ratio at least these are very similar t suggestions made by the rev recently[1]—excepting on the qu of grants. It is surprising to fin author apprehensive of incr grants to local government State-local finances are bein creasingly inter-related with intensification of planning at the roots level. The extent of local nomy depends mainly on the s

[1] *IJPA*, Special Number on Urbanization and Urban Development, Vol. XIV, July-September, 1968,

of local government in the overall governmental system of the country, and not on the level of grants in local budgets. This is quite evident even at the States' level with statutory and plan grants from the Centre. It is, therefore, possible to secure local autonomy by way of relaxation of the existing legal and administrative stranglehold of the States, rather than through the avoidance of grants.

The author has not fully worked out his ideas on reforming tax administration, and it is hoped that more attention would be paid on this aspect in subsequent editions of the book. Considering that this is a revised version of a doctoral thesis, we hope to have more analytical and empirical studies from the author in the neglected field of public finance in India at the local government level. This is just a happy beginning.

—ABHIJIT DATTA

MATERIALS MANAGEMENT; By N. K. NAIR, Bombay, Asia Publishing House, 1968, pp. 347.

Materials management today is a subject of increasing importance for many reasons. For efficient planning and economic working of any project, it is necessary that the available capital resources are used most judiciously. Materials, covering an investment of well over half, thus become a critical area for the management. But even though it is so, there seems to be today an insufficient awareness of the subject in the country. In this context alone, N. K. Nair's book on 'Materials Management' is a welcome addition to the meagre literature on the subject published in India. Basically, materials management today is concerned with the entire range of functions which affect the flow, conservation and utilization, and the quality and the cost of materials. These functions include materials planning and programming, purchasing and inventory control, receiving and warehousing, storekeeping, transportation and materials handling, and disposal of scrap and surplus. Nair has chosen 'stock control', 'purchase', 'stores', and 'packing' as the four principal areas in the book. As stated in the preface itself, 'the book primarily deals with the handling of stores and purchase in the industrial organizations manufacturing engineering goods'. This to some extent restricts the overall focus of the book. Even in respect of the four major areas, covered by him, the author, because of his long association as a Stores Officer in an engineering enterprise, has devoted far greater space to 'stores' as compared to the other important area of 'stock control'. His effort to compress 'stock control' in about sixty and odd pages has resulted in an oversimplification of certain concepts. For example, in the discussion on Order quantities, the rules have been summarized to the exclusion of any adequate appreciation of the limiting factors. A reference to certain important parametric factors, *e.g.*, shelf life, future availability, obsolescence or Government's policy, would have been welcome to avoid any erroneous conclusions on the subject. Again, in respect of the Order quantity calculations, procurement cost per order has been taken at Rs. 7. This even by the most conservative Indian standards is far too low as the figures actually used today in such computations range from Rs. 20 onwards.

The most valuable section of the

book is in respect of lay-out and location system, storage equipment, materials handling and storage and preservation methods (Chapters 28 to 31). In many of the industrial projects in the country, these problems are hardly given any worthwhile attention with the result that the store-shed or warehouse in a project is generally conspicuous by its untidiness. In regard to material handling and storage equipment, the author has provided a number of simple line diagrams which effectively convey the desired construction details. In most of the cases, the suggested equipment is easily available indigenously at nominal cost.

The author has presented a large number of forms which have been appended at the end. These forms very elaborately cover many of the internal project procedures, specially relating to purchase and receipt. While these are useful, it would have been a great advantage if some report formats were also presented regarding inventory status or the volume of inventory holdings in any project. Today this is a rather weak area and even though while people are talking about the use of computors for inventory balances, little thought is being given to the urgent need of a management information system (MIS) within a project to periodically apprise the management of the problems in the field of materials management. This does not way mean that the compu electric data processing is not able aid to materials m ment. The point to be s is that there is need to and develop suitable infor systems—suitable to the requi of individual projects—so th problems of materials mana *vis-a-vis* the question of stoc and surpluses, are tackled effe

While the author has discu number of administrative asp problems of materials manag adequate stress on the lea problem would have been helpful. Today, as the nu published studies indicate, lea contributes very largely to the up of inventory levels. Ho the fact remains that in spite inadequacy of the country's structure, particularly of the tra system, import licensing, exchange restrictions, pauci standard domestic products, tantial improvements can be e by materials managers by add themselves even to relatively s aspects of 'stores' and 'purch their organizations. These tw are the author's forte and as su book would prove valuable fc trollers of stores and pu materials managers and pu officers in engineering enterpri

—A. P. S

THE INDIAN JOURNAL
OF
PUBLIC ADMINISTRATION

Vol. XV July-September, 1969 No. 3

GOVERNMENT'S ROLE IN DEVELOPMENT OF SCIENCE

B. D. Nag Chaudhuri

ONLY about fifty years ago the governments of even the most advanced countries of those times, the United Kingdom, France and Germany were only peripherally concerned with science. Scientific societies such as the Royal Society in London, the Academic Francaise in Paris, which were founded some two or three centuries ago, were supported by small grants as an encouragement to a worthwhile but remotely useful intellectual pastime. Scientists contributed little to the major problems that confronted governments. Science like the arts received support as a part of role of the court or the government to acquire prestige. Government supported literature, art, music and science more or less on the same footing as any other creative activity of the human mind. Patronage was, therefore, uneven and dependent on individual relationship with the government. Individuals trained in the scientific methods, however, occasionally contributed because of their individual connections and mainly through their robust common-sense. On the other hand, Lavoisier was guillotined, and Rumford was imprisoned and banished, although attitudes had changed since the time of Galileo who had to go before the inquisition for maintaining the supremacy of rational examination and experiments. The scientific attitude had gained a place in the thinking of Europe and, if not totally accepted, was not regarded as sinful. The acceptance of a scientific attitude gained ground slowly throughout the nineteenth century but its impact on statesmen and governments was small and peripheral.

Changes came rapidly from the time of the first world war. The role of science in military operations became evident during the war and led to governments playing a more positive role in the development of science in some of the advanced countries mainly in the expectation of what science could contribute to national defence and specific areas of development. Amongst all the leaders of Governments, immediately after the first world war, perhaps nobody saw as clearly as Lenin, the government's role in the development of science and in ensuring the application of science and its benefit to the people. All the major countries of the world which include the United States, the United Kingdom, Soviet Union, Germany, France and Japan did make efforts to develop science through government patronage. The major areas of government patronage were selected on rather arbitrary considerations, depending on the personality and contribution of the scientists who claimed government funds, rather than through any deliberate policy. Perhaps, in the Soviet Union alone there was some effort at selection of specific areas of government effort. However, there were three areas of scientific activity that commanded the attention of all governments during the period between the wars. These were the exploration of natural resources of the country, public health, and agriculture brought about by scientific events in the geology, the isolation of sensitive factors of diseases and epidemics and the study of the insects and genetics.

The second world war demonstrated the importance of science and technology in not only fighting a campaign but also in the support of the civilian front. The totality of the war, the almost equal importance of the battle front and the civilian front in waging a successful war were clearly demonstrated. What was even more important was the success of science and technology in the war which clearly showed the need to mobilize and harness science and technology to gain the maximum possible ability to resist and defeat an enemy. Two specific events, the development of atomic bomb, and the development of Radar probably illustrate the significance and the potential of technological contribution from basic scientific discoveries. The mobilization of scientific and technological effort made it possible to apply current scientific discoveries in a short time through massive and coordinated effort of thousands of scientists, technologists and other people working together. Each was a single project. The atom bomb project at its peak employed about 1,65,000 scientists, technologists and others and cost a total of 2 billion dollars in nearly four years from a zero beginning.

After the second world war science and technology became a

major concern of most advanced countries. The lessons of war and the potentialities of the future were realized by political and military leaders. Scientists and technologists were able to influence their governments to organize and take responsibility for the development of science in a massive way. Since the expenditure on science was increasing rapidly questions began to be asked as to how the money should be spent. The role of each government in the development of science is conceived differently due to differences in each nation's resources and capabilities. There is a deliberate and sustained effort in almost all advanced countries and some of the developing ones to formulate policies and plans which will enable these nations to derive benefits from their investments in science and technology speedily and more efficiently. The problems of technology and their management vary. The discovery, exploitation and conservation of natural resources such as coal, minerals or water, cannot be dealt with in quite the same way as the use of science to ensure better health and eradicate diseases for our citizens, or more abundant agricultural crops, although each contributes to higher standards of living and better employment for people. Governments can no longer ignore that not only science and technology is useful and its benefits are increased if it is developed in an appropriately balanced manner.

High standards of living in the more advanced countries have a close relation with the development of science and technology and its rapid application. Scientific research creates an increasing flow of new scientific knowledge and expands into many new areas. The application of this knowledge produces new processes and new products as well as new tools, all of which lead, when properly deployed, to a better life for the citizens of a country. The role of a government is on the one hand to ensure that the fruits of science are passed on to the people and on the other create the situation that gives maximum activity in science within the limits of available resources.

II

Apart from the surveys of botanical, zoological, geological resources of the country and the research carried out by individuals in some Universities and one or two government and private institutions such as the Haffkine Institute at Bombay and the Indian Association for the Cultivation of Science at Calcutta, scientific activity was extremely restricted in India until the beginning of World War II. We were fortunate in having as our first Prime Minister Pt. Jawaharlal Nehru who realized more than most people that science and its application are the only means to combat backwardness and increase

the pace of national development. Nehru used the scientific institutions created due to the exigencies of the war as nuclei for further development after Independence. He also created a large number of scientific institutions such as the Atomic Energy Department to carry out scientific investigations and develop application of scientific knowledge. The investments of money by government in scientific activity increased from Rs. 3.5 crores in 1948-49 to Rs. 25 crores by 1958-59. The Government of India under the leadership of Nehru was concerned not only with increasing the funds allocated to research activities of the government and sponsored institutions, it was also anxious that the benefits from science and its applications flow to the people.

These benefits are really of two kinds. The material benefits of science are those which lead to new techniques, new products, or new processes which lead to better living conditions for people. The other group of benefits are those of the human spirit such as the greater knowledge and understanding of the world or the universe in which we live and the development of attitudes of mind which bring about a rational approach to human problems. It was with a view that both of these two types of benefits from science should be increasingly available to our people that led Nehru to formulate the Scientific Policy Resolution of March 1958. The Resolution emphasizes the material and social benefits of science and affirms the government's intention to promote an environment in which science will be developed keeping the nation's social and economic objectives in view.

Since 1958, with the object of fulfilling some of the stated aims of the government, there has been large increase in the funds for science. These allocations are a part of the development plans. The Government of India like every other government is the main source of funds for scientific research. A network of institutions engaged in scientific research has come into existence to provide direct and indirect benefits to industry and agriculture. There has also been substantial development of research in specialized fields in a variety of new as well as old institutions and centres. The most significant of these developments is the growth of basic research in various institutions of the Department of Atomic Energy and the Council of Scientific and Industrial Research and also in universities and other institutions which they have funded.

The salient development in applied research with tangible economic benefits has been in the agricultural sector mainly in the institutions of Indian Council of Agricultural Research (ICAR) which had led to the development of special varieties of seeds and better agronomic practices. These in turn have led to significant gains in agricultural

productivity in the country, particularly in the cereals in the last two years. The investigations in the area of earth sciences have led to the discovery and utilizations of new mineral deposits.

During the last ten years there has been roughly about a ten-fold increase in expenditure on scientific research and its application. The total expenditure on scientific research and development in the country in 1969-70 is roughly about Rs. 132 crores of which Rs. 118 crores is spent by the Central Government, more than Rs. 8½ crores by the State Governments and about Rs. 5 crores by private industry. The Central Government's expenditure on scientific research therefore is really a major factor constituting 88 per cent of the entire scientific research expenditure. For comparison the total expenditure on research in 1958-59 and 1969-70 and R & D expenditure as a percentage of the G.N.P. are given below:

	1958-59	1969-70
(*a*) Total G.N.P. at current prices (Rs. crores)	12,600	31,730
(*b*) R & D expenditure (Rs. crores)	25	132
(*c*) R & D expenditure as percentage of G.N.P.	0.20	0.42

The amount that is being currently spent on research and development as a percentage of G.N.P. is considered to be an important indicator of future growth. A comparison of the ratio of R & D expenditure in our country with that of others indicates that while R & D expenditure has increased substantially, from 0.20 to 0.42 in the last decade, it does not yet compare favourably with R & D expenditure of the developed countries as percentage of the G.N.P. There is every likelihood that the ratio of our R & D expenditure to the G.N.P. will increase to about 0.6 per cent by the end of the Fourth Five Year Plan. However, such comparisons can be misleading as a large part of the R & D expenditure in the U.S.A. or U.K. or U.S.S.R. are in areas such as Defence and Space exploration whose benefits to the economic growth of the nation may not be very significant. Countries like Japan, Canada and West Germany who have a negligible R & D expenditure in the areas of Defence or Space spend 1.5 per cent, 1.0 per cent and 1.4 per cent respectively of their G.N.P. in their research and development while the U.S.A., the U.S.S.R. and U.K. with large defence-oriented research spend on R & D 3, 2.5 and 2.3 per cent respectively of their G.N.P.

The UNESCO Conference on the Application of Science and Technology in Asia in August 1968 recommended the governments of developing countries to increase the R & D expenditure to 1 per cent of the G.N.P. within a decade. This recommendation for stepping up expenditure on scientific research is certainly commendable, but it will lead to a higher economic growth rate only if areas of R & D activity are carefully selected and the manner of expenditure is intelligently controlled. The problem of greater investment in R & D as well as a more careful selection of areas of scientific and technological effort has been discussed in the context of science policies of many nations particularly in some of the OECD studies. However, there have been no clear conclusions as to what methodology of choice will isolate these specific areas of scientific effort which will lead to maximum benefits. Governments are, therefore, in the final analysis dependent on judgement rather than 'deduction' for their selection of areas of effort. That is not to say, that every effort should not be made to narrow the area of judgement by thorough investigation and analysis.

Of all the resources for development, the most basic are human resources, that is trained manpower. With the rapid advance in science and technology and the growing complexity of industrial and economic organizations, there is increasing demand for larger numbers of highly skilled and trained personnel drawn from different disciplines and functioning generally in composite teams rather than as individuals. As an economy develops, the requirements of individuals with more advanced and specialized training increases, while the need for persons at lower levels of skill and for the semi-skilled and unskilled steadily diminish. It takes five years or more to give the basic training needed by an engineer or a doctor, and a much longer period to provide research and practical experience essential for filling positions of greater responsibility. To secure the required outturn of scientific and technical personnel and build up an adequate foundation of scientific research may take a nation, a whole generation.

As the economy grows, the emphasis tends to shift from numbers to quality and experience. The character of education at each stage in schools and colleges must develop to provide for this shift to sophistication. The development of more complex technology and science involves the system of management and organization in technological and industrial organizations which also have to be increasingly alive to research and development and the application of their results.

The changing nature of science and technology also implies that

encouragement to innovation and experimentation in the training programmes and organization of institutions is essential to provide opportunities for original and creative activity and the development of the highest quality of manpower.

During the last ten years there has been considerable expansion in the facilities for higher education in science, agriculture, technology and medicine. Besides, increase in the number of seats in each institute, the number of institutes itself has also considerably increased as indicated below:

Year	*No. of universities*	*No. of agricultural and veterinary colleges*	*No. of Engineering and Technological Institutions*		*No. of medical colleges*
			Degree level	*Diploma level*	
1960-61	47	68	102	195	66
1965-66	64	90	133	274	87
1968-69	76	N.A.	138	284	93

Science education at the university stage has received great impetus as will be seen from the following data:

Year	*Enrolment in science courses at university stage (in lakhs)*	*Per cent to total enrolment*
1960-61	1.9	26.0
1965-66	5.1	41.0
1968-69	6.8	40.0
1973-74 (anticipated)	11.9	45.0

The outturn of scientific and technical personnel at graduate and post-graduate levels for different scientific disciplines are given in the

table below:

	(In thousands)					
	**Graduate*		*Post-Graduate*		*Total*	
	1958	1968	1958	1968	1958	1968
(*a*) Natural Resources	20.5	50.5	4.0	12.5	24.0	62.5
(*b*) Agricultural and Veterinary Sciences	2.0	8.8	0.3	1.4	2.3	10.2
(*c*) Engineering & Technology	6.5	26.0	5.0	16.8	11.5	42.8
(*d*) Medicine	—	—	3.0	8.5	3.0	8.5
	28.5	84.8	12.3	39.2	40.8	124.0

It may be noted on an average there has been about 300 per cent increase in outturn in agriculture, engineering and technology sectors during the last ten years. Overall increase in outturn in all the sectors both at graduate and post-graduate levels was about 200 per cent.

Increase in the stock of scientific and technical personnel has been estimated as under:

	(In thousands)					
	**Graduate*		*Post-Graduate*		*Total*	
	1958	1968	1958	1968	1958	1968
(*a*) Natural Sciences	140	349	40	114	180	463
(*b*) Agricultural and Veterinary Science	16	58	3	10	10	68
(*c*) Engineering & Technology	62	192	52	156	114	348
(*d*) Medicine	35	27	36	79	71	106
	253	626	131	359	384	985

*For this purpose a degree in engineering, technology and medicine has been taken as a post-graduate qualification and a diploma in these subjects has been taken as a graduate level qualification.

It will be seen that the overall increase in the stock has been about 150 per cent both at graduate and post-graduate levels. The increase in agricultural and veterinary, engineering and technology groups has been more than 200 per cent.

The total estimated manpower available for R & D during 1958-69 is of the order of 59,000 as against 18,000 in 1958-59 as shown below:

	1958-59	1968-69
(*a*) Central Sector	14,155	43,928
(*b*) Universities	2,600	7,807
(*c*) State Sector	1,000	6,900
Total	17,755	58,635

The break-up of the Central Sector is:

	1958-59	1968-69
(*a*) Major Organizations		
1. C.S.I.R.	3,512	8,848
2. D.A.E.	1,004	6,925
3. Defence R & D	1,500	4,747
4. I.C.A.R.	1,500	7,820
5. I.C.M.R.	1,001	1,221
	8,517	29,561
(*b*) Central Ministries	5,638	14,367
	14,155	43,928

Questions have been raised recently that while scientific research expenditure has increased more than five times in about eleven years and our manpower by three and half times, the benefits accruing have not been in relation to these large increases. There are several factors that have to be understood in this connection. Firstly, due to the decreasing value of the rupee in the last eleven years the effective increase of expenditure of scientific research may be only about half as much or two and a half times and not five times. Secondly, a large fraction of the investment has gone into building what might be called the infra-structure, that is building laboratories, equipment, facilities and training. Thirdly, the gains from research have to be seen at a point of time which is a few years after the investments, since research is an activity which takes time. Fourthly, investments in scientific research are such that there is an element of chance, and gains in one sector may not be as

good or profitable as in another. Moreover, the impact and benefits of science cannot necessarily be quantified or even clearly isolated in areas as defence, education or social services like health and control of diseases. Scientific effort in the discovery of natural resources and measures of husbanding them lead to visible gains but cannot always be put in exact relation with money spent on such activities. There are other areas where benefits are clearly visible, direct and quantifiable. Appropriate relations between the scientific effort and resources invested and the gains achieved can be worked out in these areas.

Finally, there have been substantial benefits from scientific research and its applications in our country in some areas. For example, in the last two years there has been spectacular gains in agriculture particularly in cereals, there has been gains in the control of diseases, in nutrition, in the diversification of industries. Some of these gains are minor in character, nevertheless they are significant. The question, therefore, is not whether one should spend more in scientific research or not, but having decided to spend as much as one can, to select those areas of research which might be able to give greater benefits in a reasonable short time. There is, however, an element of chance in the exercise of this judgement since all the parameters are not quantitatively known.

While a structure of research had come into existence in the universities, scientific and industrial laboratories mostly financed by Central Government, we have still some way to go in building up sound scientific traditions with standards of criticism and evaluation that can be maintained independently of Government. Government's evaluation even in U.S.S.R. have tended to be coloured by predilictions, personalities and bureaucratic methods and in consequence have often hindered scientific development as much as helped it.

In the socialist countries of Europe, before revolution there was an older fabric of science broadly on the pattern of the countries of Western Europe. After revolution all funds for research began to come from government, and a very basic policy was adopted to establish autonomous academies of science and to use them as a primary research agencies to build up universities and scientific institutions as free as possible from official control. In the countries of both Eastern and Western blocks, scientists enjoy a great deal of autonomy. The position in India is somewhat different. Most of the research expenditure is incurred in government or quasi-government agencies. Very little or practically no research funds are available from private sources. The universities and private scientific institutions thus have to depend

almost entirely on government grants. There has not been enough time to build up a strong and independent tradition of scientific criticism and evaluation. The administrative machinery of Government continues to be highly centralized with a great deal of secretariat control on details, partly because the system was taken over from an alien government and partly because of the lack of other forces of development of science. In this situation there are serious dangers of scientific progress being hampered by the pervasive pattern of hierarchical authorities. This is what is happening in India at present.

The number of scientists and technologists who have migrated from India is estimated at 2.5 per cent to 3 per cent of the total stock of about 1 million, *i.e.*, about 25,000 to 30,000 Indian scientists and technologists are working abroad. This is sufficiently a large number to cause concern considering that only 61,000 of the total stock of scientists and technologists are now working in research and development activities in India. The causes of the relatively large outflow are amongst others, difficulties in getting suitable employment, inadequate utilization of scientific and technical personnel in industries and poor working conditions. The problem merits attention for the reason that a proportion of those who have migrated abroad, perhaps 10 to 15 per cent belong to the group whose level of achievement initially was probably much higher than others, even though it is true that a large number of those who have chosen to remain in India have also attained comparable levels of achievement. The knowledge and skill acquired by 3,000 or so scientists and technologists since their migration abroad are also often a kind that could be of great use to India.

Active encouragement for the development of R & D is relatively recent even in the more advanced countries of the world, for which reason this is one of the areas in which the less developed countries like India could catch up fairly quickly if a concentrated effort is made to produce, retain and actively assist scientific and technical personnel of the highest quality within them. China and to some extent Japan have deliberately fostered such policies. This requires, however, not merely raising the level of R & D expenditure as a percentage of the gross national product in our country but looking into the specific requirements of the situation and that need to be taken immediately to improve the atmosphere for research of high quality. The "brain drain" itself is not the disease but a symptom of the lack of it.

There has been considerable progress in the development of science in the country and we owe a great deal to the Science Policy Resolution

of the Government, 1958 for this. However, science and technology is developing and changing rapidly. Obsolescence haunts us almost in every sector of application of science and technology. Science policy therefore cannot be static. These policies must change through periodic assessment so that we take stock of our position and chart a course which may be somewhat different than in the past and yet in keeping with our aims and objectives. Our methodology and instruments on action must be clear, only then can we chart a better course towards our goal. We hope through the efforts of the last 25 years, to be able to put a sound base of science and technology in the country. This infrastructure has given us the capacity to absorb technologies from abroad and take advantage of any new breakthrough. This capacity has not been used anywhere to the extent and has to be fostered by deliberate policies. The availability of manpower and also absorbing technology call for a programme of research and development which is related to product and process development and ultimately manufacture of new products. Appropriate relationships between these separate areas of research, development and manufacture will further strengthen and encourage development of technology.

These policies have to be kept into view when we enter into technical and scientific achievements of the real source. Another instrument of policy is the relative allocation of funds in the various sectors of R & D as an indicator of our national goals and our strategy for achieving them. Since the needs of research substantially exceed the resources available for research activity, the determination of the relative importance and priorities of Research and Development in different sectors is not an easy proportion. This is a wide and vital problem which can be tackled only by the scientific community and the Government acting in concert.

There is a large area of indirect benefit to society from science, for example, in health, in agriculture and in education. These areas of research can be developed further. In a country as poor as ours these areas of indirect benefit can percolate to large masses of our people and give a feeling that they are participants and beneficiaries of national development. The R & D in natural resources, such as forests, water, minerals and land conservation and use can be oriented towards solving certain problems of poverty through discovering suitable resources which can give rise to worthwhile economic activity. Finally, there is the basic issue of cultivating rational attitudes in all areas of activity so that there is encouragement for a climate of science development to encourage and expedite the benefits of science. To go forward into the era of science and to participate in it fully to the benefit of our

people is the greatest adventure that we as a nation wish. We can only do so if we lay down policies and instruments of action in the crucial areas and this will help us to achieve our further course. Industry singly or in groups has yet to finance their future development either by themselves or jointly through Government and industrial financing. Thus, every industry, while at the start it is a user of R & D, should move towards becoming at least a sponsorer of R & D for the sake of its own future viability and growth. There should be effective communication links between the National Laboratories, in particular those working on applied research, and the industry so that their research programmes are oriented to the development needs. It is also necessary to encourage and facilitate mobility of scientific personnel among the research institutions and National Laboratories as well as the universities. Since government laboratories and institutions recruit personnel from universities, which train them, the communication between the university research and research in Government organizations should be closer so that the needs of the users can be appropriately looked after in the training programmes.

The Government today has a major role to play in encouraging research and development activity and the responsibility to see that the benefits of such activity flow to the people. On the one hand, there is every reason to increase our scientific research and development expenditure from its present 0.4 per cent of the G.N.P. to about 1 per cent of the G.N.P. as rapidly as possible, on the other hand this increase will be largely infructuous if at the same time we do not maintain a proper balance between the activities in various sectors of research and development. Certain sectors and areas have been neglected or have developed only to a low level. Much greater effort in these specific areas particularly where benefits are likely to be quick and large would have to be made. Simultaneously with the effort to identify and invest more in these crucial sectors, the management of scientific research will have to be given much more attention. Problems of a closer relationship between scientists at various levels, eliciting their views at various decision-making stages and the impact of scientists and scientific thinking on our society will need a great deal of attention; and yet without these basic tasks being attended to, our scientific effort might well become sterile.

SCIENCE AND NATIONAL GOALS*

Vikram A. Sarabhai

THE Scientific Policy Resolution of 1958 of the Government of India† illuminates clearly and concisely the relationship of science and national goals. And yet, more than ten years later, most of us are largely dissatisfied with the role that science is currently playing in promoting national goals. What is the problem?

Our national goals involve leap frogging from a state of economic backwardness and social disabilities, attempting to achieve in a few decades a change which has historically taken centuries in other lands. This involves innovation at all levels. It was not until I was made responsible for the Atomic Energy programme of this country and came face to face with problems of development through the application of advanced technologies and basic research, that I became conscious of the problems that are encountered when Government has to perform a role which goes much beyond the maintenance of law and order and the security of the nation.

I recognize that governments are involved in providing stability as well as change to society, two seemingly conflicting goals. At one end of the spectrum are certain administrative services, acting on past precedents and traditions providing security and continuity, impersonalized to the extent that if one person is substituted by another, every one knows how the successor will behave and operate under a given set of circumstances. At the other end, there are organizations based on research and development, involving individuals who act on insights and hunches, non-conformists questioning assumptions, innovating and learning. The two extremes require organizations and working cultures which are rather different. We would have near disaster if we have a judge who is an 'innovator' instead of a 'preserver'. On the other hand, an educational or a scientific administrator would be sterile and ineffective if he is a preserver rather than an innovator. Most tasks encountered in the contemporary world call for organizations

*Part of the material contained in this article was included in the Convocation Address delivered at the Indian Institute of Management, Ahmedabad in April 1967.

†It is worthwhile to refer to the document, and I therefore reproduce it as an annexure.

wherein creative thinking and innovation are essential ingredients of survival as well as growth. Industrial and agricultural development, and the conduct of foreign affairs call for innovators, rather than traditional administrators.

It is perhaps useful to note that if in a given situation we are content to leave all environmental conditions unchanged, we can at best achieve an evolutionary change through the natural course of survival and growth. On the other hand, forcing the pace of development needs probing the boundary conditions of each situation so as to push in the direction in which change is possible. The instruments of change have therefore to be those who do not take their environment for granted.

Most of us are familiar with the hierarchical organization structures involving vertical controls which continue to dominate governments whose principal role until recently was one of preserving a social order. They carry an administrative service, characterized by anonymity coupled with security of tenure, insulating individuals from outside pressures. The system has built in controls which act negatively, attempting to stop a wrong thing from happening.

To realize how distant this culture is from one wherein innovators are involved in developmental tasks, we can examine some of the factors which have been observed in the study of Atomic Energy. Organizations were built round men, and no organization chart stood in the way of recognizing and rewarding talent. Amongst professional groups of scientists and engineers, motivation and control was largely inherent and contained in professional commitments. Control was exercised through discussion and judgment of peers with administration performing largely the role of service. Autonomy of working conditions and self-development were important to the innovators. Horizontal control systems are effective when they involve mobility and interactions. The economic analogue of horizontal controls is competition. Horizontal controls are implicit and do not have to be imposed from above. For instance, if there is a situation where supply exceeds demand, the price is controlled by competition rather than by price control. Each competitor, without having to be told so, fully realizes the negative implications of his charging a higher price than others. The military application of it is seen in arms control through the balance of terror. Armed conflict between the U.S. and the U.S.S.R. during the last twenty years has been prevented not by action of the United Nations, but by the implicit threat of reprisals.

While vertical controls are dependent on a system of reporting and

feed-back involving more than one level, horizontal controls are dependent on direct interaction at the same level. The 'hot line' between Moscow and Washington is necessary to preserve stability through horizontal controls between the two power blocs. The effectiveness of vertical controls is dependent on the time span of delegation. For instance, if the Public Accounts Committee reviews the operation of a Government undertaking two to three years after an event has occurred, its comments cannot have any possible effect in producing control on tactical decisions by the management. With a time span of this order only a strategic decision such as one involving the establishment of a steel plant could be questioned with relevance to controls.

One may ask why competition which is synonymous with horizontal controls has become associated with capitalism? Are horizontal controls contrary to socialism or the State ownership of the means of production? Would it hurt if Hindustan Steel were not just one company? Would not the managements of Bhilai and Durgapur have positive incentives if they were competing with each other and with TISCO and Indian Iron? Can vertical controls of a Board of a monolithic corporation or of the Bureau of Public Enterprises, or of the Parliamentary Committee on Public Enterprises, or the Auditor General provide adequate substitutes for what can be gained through accountability for task performance in a situation of survival and growth in a competitive economy? Vertical controls usually specify what cannot be done. The Industries Development and Regulation Act is a typical example of such control. Top bodies involved in such control can rarely function in anything but roles of strategic decision-making. When they involve themselves in the decision-making processes of day-to-day administration, the system indeed gets fouled up. I would suggest that since vertical controls inhibit innovation and remove the decision-making process from the operating level, they are unsuitable as a system for the developmental tasks of government.

We are not suggesting here the abdication of supreme authority at the topmost echelon of government. But one is talking of a self-restraint and exercise of power based on understanding of the control systems appropriate to developmental functions. One is moreover asking for a sophistication which recognizes that there is a distinction between a formal and a real organizational structure, the social culture of an organization being influenced mainly by the men who are in it, the determining factors being their assumptions and outlook on life and their attitudes related to their past training and traditions. It is because of this that one despairs of finding solution to our real problem by only organizational changes.

In research laboratories, and in other developmental tasks, it seems important that the Chief Executive, besides being involved in policy making and administration, maintains direct contact with his professional role. The creation of administrative practices appropriate to a given technology or set of tasks comes with familiarity and knowledge of acquaintance of the technology or tasks concerned.

There is a need for a constant interplay between the basic sciences, technology and industrial practice if economic progress is to result from the activity undertaken. The wearing of several hats by the same person and the mobility of personnel from one type of activity to another have undoubtedly provided the impetus for growth in the projects of the Department of Atomic Energy. We may contrast this with the practice prevalent in higher educational institutions for basic sciences and technology and national laboratories where the work of applying the results of research to practical ends had to be done through other units, not organically related to the laboratories or the men that work in them.

The various factors indicated earlier are inter-related and mutually dependent. A change in one influences the total scheme of things, for in organizational structures and culture, the whole is more than the sum of its parts. Structures, procedures and techniques are important, but these must be sustained by a cluster of attitudes conveying care, trust and nurturance on the part of responsible persons.

With the problems that we are facing in the country today, it is pertinent to ask how the considerations which we have discussed are relevant to Government. The foremost need would be to identify activities where developmental functions are primarily involved. Organizational reforms involving systems of horizontal and vertical controls would grow naturally when men who are appropriate for these tasks are placed in positions of responsibility. Will we have the conviction and courage to introduce these changes? The answer is surely crucially related to our survival.

We have today in India an excellent infra-structure for undertaking complex tasks involving science and technology for resolving the real problems of the nation in the production of food, for industrial development, energy resources, communications and transportation. We can make a qualitative difference in the educational system through the use of new techniques of learning and we are rich in our human resources. It is now clearly necessary to translate the broad national goals into precise objectives to be realized in two, five and ten years.

Using techniques of systems engineering and operations research, we have to determine in each case the most advantageous route to follow, and decision-making must be related to quantitative analysis of all factors and inputs, to permit a commitment which is based on what we wish to consciously achieve paying a well understood price.

We often hear in this country talk of a science budget. This would be relevant only if we were pursuing science for its own sake. What are needed, however, are the priorities for broad national goals and, dependent on these to determine what effort in science and technology is called for to achieve these goals. Thus, the priority for scientific effort in a particular area follows from the priority enjoyed by the area in question in the overall scheme of things in our National Plan. We might, for instance, give top priority to the production and distribution of energy inexpensively to promote agricultural and industrial development. We know that the doubling time of our electricity consumption is about five years and therefore we would need during the next ten years to have a minimum of about 40,000 MW of additional power generation to maintain even a reasonable level of economic growth. At a cost of about Rs. 2,000 per installed KW, this would need an investment, for generation alone, of approximately Rs. 8,000 crores in ten years. If we wish to provide the most economical solution with the largest amount of import substitution, it would be reasonable to spend at least 5 per cent on indigenous R & D for improving technology and for developing indigenous capability for design and development. Thus, the expenditure on specific schemes of R & D related to the generation of power could well be about Rs. 400 crores in the next ten years. I give this example to illustrate the manner in which we can derive an estimate of the required effort in each individual specific area in order to reach a specific goal. It is only when we have analysis of this type that we shall be able to move ahead with confidence with our scientific and technological effort to realize the objectives of the Scientific Policy Resolution. Without it, we shall foster neither science nor realize our national goals.

ANNEXURE

GOVERNMENT OF INDIA
SCIENTIFIC POLICY RESOLUTION

New Delhi, 4th March, 1958

The key to national prosperity, apart from the spirit of people, lies in the modern age, in the effective combination of three factors—technology, raw materials and capital—of which the first is perhaps the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources and reduce the demands on capital. But technology can only grow out of the study of science and its applications.

2. The dominating feature of the contemporary world is the intense cultivation of science on a large scale and its application to meet a country's requirements. It is this, which, for the first time in man's history, has given to the common man in countries advanced in science, a standard of living and social and cultural amenities, which were once confined to a very small privileged minority of the population. Science has led to the growth and diffusion of culture to an extent never possible before. It has not only radically altered man's material environment, but, what is of still deeper significance, it has provided new tools of thought and has extended man's mental horizon. It has thus influenced even the basic values of life, and given to civilization a new vitality and a new dynamism.

3. It is only through the scientific approach and method and the use of scientific knowledge that reasonable material and cultural amenities and services can be provided for every member of the community, and it is out of a recognition of this possibility that the idea of a welfare state has grown. It is characteristic of the present world that the progress towards the practical realisation of a welfare state differs widely from country to country in direct relation to the extent of industrialisation and the effect and resources applied in the pursuit of science.

4. The wealth and prosperity of a nation depend on the effective utilisation of its human and material resources through industrialisation. The use of human material for industrialisation demands its education in science and training in technical skills. Industry opens up possibilities of greater fulfilment for the individual. India's enormous resources of manpower can only become an asset in the modern world when trained and educated.

5. Science and technology can make up for deficiencies in raw materials by providing substitutes, or, indeed, by providing skills which can be exported

in return for raw materials. In industrialising a country, a heavy price has to be paid in importing science and technology in the form of plant and machinery, highly paid personnel and technical consultants. An early and large scale development of science and technology in the country could therefore greatly reduce the drain on capital during the early and critical stages of industrialisation.

6. Science has developed at an ever-increasing pace since the beginning of the century, so that the gap between the advanced and backward countries has widened more and more. It is only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science that we can bridge the gap. It is an inherent obligation of a great country like India, with its traditions of scholarship and original thinking and its great cultural heritage, to participate fully in the march of science, which is probably mankind's greatest enterprise today.

7. The Government of India have accordingly decided that the aims of their scientific policy will be:

(*i*) to foster, promote and sustain, by appropriate means, the cultivation of science, and scientific research in all its aspects—pure, applied and educational;

(*ii*) to ensure an adequate supply, within the country, of research scientists of the highest quality, and to recognize their work as an important component of the strength of the nation;

(*iii*) to encourage, and initiate, with all possible speed, programmes for the training of scientific and technical personnel on a scale adequate to fulfil the country's needs in science and education, agriculture and industry, and defence;

(*iv*) to ensure that the creative talent of men and women is encouraged and finds full scope in scientific activity;

(*v*) to encourage individual initiative for the acquisition and dissemination of knowledge, and for the discovery of new knowledge, in an atmosphere of academic freedom; and

(*vi*) in general, to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.

The Government of India have decided to pursue and accomplish these aims by offering good conditions of service to scientists and according them an honoured position, by associating scientists with the formulation of policies, and by taking such other measures as may be deemed necessary from time to time.

SCIENTISTS AND MANAGEMENT

Atma Ram

OURS is truly an age of spectacular human achievements and exciting changes. Changes are the result of the achievements made by human intellect and endeavour. Science and technology are bringing about rapid and revolutionary changes in the human environment, thinking and attitude. Since change is the cornerstone of progress, science and technology have become key factors contributing to the progress of mankind. Society took a new turn when the steam engine was invented and industrial revolution set in about 150 years ago. The changes were revolutionary; muscle power yielded place to mechanical power. Yet scientific achievements and social changes kept some pace with each other. Developments in science and technology have now become more rapid and they are forcing changes in human society with greater speed. The truth is that human mind and society are unable to keep pace with the changes being forced by science and technology. In the past few years quite a few discoveries and inventions achieved by scientists have upset old values and standards. No sooner we come to accept something than it begins to change. Such is the impact of science and technology these days.

Liaison Between Physical and Social Scientists

It is not only in under-developed countries, but also in scientifically and economically advanced countries that people find it difficult to keep pace with the effects of science and technology and to mould themselves according to them. The difficulty arises because man is discovering that what he believed to be impossible could now become a reality and he cannot escape being affected by such changes. Yet another reason perhaps is that science and technology make sense to him only in the simplest terms, radio, car, anti-biotics. He is largely unable to appreciate or be involved with the methods of science which make the impossible possible. Scientific methods and process are still bewildering to most people in the society. Partly the social scientists are also responsible for not helping actively to increase the speed of change. Most achievements are made by physical and biological scientists, whereas human attitudes are governed more by traditions and social

conditions. The latter form the sphere of study of social scientists. The lack of communication and close relationship between the physical and social scientists to some extent hampers the rapid assimilation of scientific changes by the bulk of the population. In developing countries where social conditions and traditions are rigidly held to the heart, changes forced by science and technology tend to create serious social imbalances, if not chaos, out of "scientific order".

The Scientific Order

The scientific order, or more appropriately the order of the modern age, should be appreciated by people at the top who should allow it to filter down to the lower but broader rungs of the society. Scientific order cannot be appreciated and made use of by a society where the top echelons are strangers to scientific method. Important institutions in a society should have scientist managers at the top or very near the top for the appreciation of the present day scientific order, and its utilization. The major institutions are the government, industries, universities and legislatures. In the first three, *viz.*, the government, industry and universities, scientists should be associated with policy-making bodies at the apex. It would still be better if the apex related to scientific matters is manned by scientists and technologists. In the legislatures, scientists should have greater representations than what we see today in our country or in other developing countries of Asia and Africa. Scientists can foresee technological changes or can do what one might call 'technological forecasting' and help estimate the consequences of these changes and advise the government in right time about steps to be taken for or against those changes. Modern armies and armaments are largely science-based, and so the scientists can be of practical assistance to the government. A proper appreciation of their strength or weakness can be made by scientists. Hence their presence in a fair number in legislative bodies is essential.

Management Gap

Now, let us come to industry. Modern industry is undoubtedly the product of scientific and technological researches. The greatest gift of modern science and technology to mankind is the myriad of industries it has generated for man's benefits. In fact, relation of industry and science has become so integral to each other that it is impossible to make an industry productive and paying without basing it on the latest technology. Here too the essential effort is to introduce scientific order in industry. The question is, who can do it? Industrial management should be such as to appreciate and understand science,

its value and necessity in operating a modern industry. We should have scientist managers in the industrial establishments to achieve greater and continuous absorption of science in the enterprise.

Currently, West European countries are agitating over what they call "technology gap" between them and the United States, which, has resulted in the prosperity gap between the two. Universities, research institutions and thinkers have been pondering over the causes which have led the West European Nations lose to the United States in the race of economic development. The cause of the present gap between United States and West European nations in matter of affluence and technology has been traced to management gap in the West European countries. It is pointed out that in spite of excellent scientific talents, rich resources and enlightened citizenry, West European countries have not been able to produce efficient managers for their industries. The result is that the industries are trailing behind scientific and technological developments with all the consequences of technological and economic lag. So, according to the American viewpoint, economic backwardness is largely ascribable to poor management in industries and government departments. If this is so in advanced countries how much is it true in a developing country such as ours? Government departments in this age of science and technology are no more administrative departments dealing with routine management affairs. Many of them have to plan and execute development projects. The development projects are in essence utilization of science and technology on a practical level. Here too the question of appreciating science and ability to introduce scientific order for the utilization of science and technology is essential. In the industrially and economically advanced countries, therefore, government departments are now increasingly being managed by technocrats rather than by generalist administrators. The advantages of having technocrats in the government departments are obvious. As members of the scientific community, they are in a better position to be in touch with the universities and centres of research which are the fountainheads of new knowledge and they can help their introduction into projects and products.

We have adopted a socialistic pattern of society as our goal. We are encouraging public enterprises in our country and already some major industries like steel, oil, minerals, machine tools, heavy engineering, etc., have been placed or expanded in the public sector. Public enterprises are going to increase in years to come. Have we taken care to create efficient managers for these public enterprises who can operate them with economic efficiency? Generalist administrators find themselves, by and large, unable to cope with the task in departments

connected with developments based on science and technology. The growth in public enterprises and the growth in the activities of the government departments attending to economic development of various kinds makes it necessary to have a system to produce efficient technocrats in our country. All sectors are bound to suffer from management gap.

Suppose the management of industry, government and the universities decides to associate scientists at the highest levels and the number of scientists in the legislative bodies is also increased, the question would then arise as to what kind of scientists will be needed in such system? Scientists are generally looked upon as academics, as people far removed from the cold realities of life and actual social conditions. They are believed to be absorbed in discovering knowledge. Such scientists are called basic scientists, while those who pursue science with an eye on economic or social results are called applied scientists, technologists. This is not to say that all basic scientists are devoid of social consciousness and all applied scientists and technologists are weded to social and economic good. While choosing scientists for management care will have to be taken that those chosen have had demonstrated sufficient social consciousness. Scientists who believe that science and technology are a tool for economic and social transformation and that scientists have an obligation to serve the people through the application of the knowledge discovered by them are indeed well suited for management responsibilities in the government or industry or for representation in the legislature.

SCIENTISTS AND SOCIAL RESPONSIBILITIES

Jamal Kidwai

IN 1663, Robert Hooke, Secretary of the Royal Society exort his fellow scientists to "improve the knowledge of all natural thir by ... experiment (not meddling with divinity, metaphysics, mora politicks, grammar, rhetoric or logick)".

For the next two hundred and fifty years, this attitude of nc involvement with other concerns of man and society remained t dominant ethic of the scientific pursuit. Scientific invention a technological innovation steadily transformed the body and form European societies, provided more devastating weapons to the armo ies of these nations, and led to European hegemony over the rest of world. But the scientists themselves remained snugly enveloped the cult of science for science's sake. Their own responsibility enc with their inventions. The applications of these inventions were nc of their business. If they despoiled the countryside or covered fair face of cities with soot or smoke or led to the uprooting of n and women and even little children from the villages to work in mi and factories, or if their creations were used by men to kill each oth that was no burden on their consciences. Alfred Nobel did not wo whether his invention of dynamite was used to blast the great alp tunnels of Simplon and St. Gothard or by rival European nations devastate each other in wars. In fact, his explosive factories ba: on a variant of the same invention (ballistite) promiscuously ser both the arsenals of France and Germany during the Franco-Pruss War. And if his conscience troubled him (largely due to a friendsl with a patrician woman involved in the European peace movemer he was able to allay it by the institution of the Nobel Peace Prize. B the Jekyll and Hyde of science cohabited in his soul in happy harmony

The scientific ivory towers began to topple during the tumu and convulsions of the first half of the twentieth century. At beginning of this century, there was still no involvement of scienti in the fate of man as such but their involvement with their own natio began. During World War I, scientists of contending nations w harnessed to their respective war chariots. Only a few tongues

conscience flared up like torches in the darkness of Europe—like Einstein in Germany or Madame Curie in France. But the rest were overwhelmed by the demands of patriotism. In Britain, Rutherford and W.H. Bragg carried out anti-submarine work for the Admiralty Board, while a number of Britain's bright young scientists worked at the Royal Aircraft Establishment. German scientists were equally involved with their own national war effort. Chemistry was in the forefront in this war and forged its deadliest weapons. The great German chemists, Walter Nernst and Fritz Haber worked on the development of poison gases. Germany's notorious attack by chlorine gas on the battlefield of Ypres was made by a technique developed by Haber. The horror and abhorence this outrage roused in the world, left Haber unmoved. But his technological feat told on his wife's frail conscience. One day Haber came home from the trenches to find that she had taken her own life.

European scientists who worked on either side of the holocaust were securely anchored in their national loyalties and no great doubts or misgivings about their roles in war assailed them. All that they asked from their Governments was that they could fight the enemy better with their brains than their brawn, in their laboratories than in the trenches. This was largely achieved after some of the brightest young scientists of the warring nations had been wastefully expended as combatants on the battlefields. The politician had realized their relevance to his principal preoccupations of national aggrandizement or national defence. For the scientists themselves it was an important step in involvement but it was only a commitment so far to their nations in an emergency. A more fundamental and human involvement was still distant.

Physics took the lead in devising the deadly weaponry of World War II—the tank, the dive bomber, the rocket and finally that weapon of total annihilation, the atom bomb. The fears and hestitations among scientists which accompanied the development of this weapon, the resurgence of ethical doubt among them which weakly sought to resist the dropping of the bomb on Hiroshima and Nagasaki is now a familiar story retold in many books. But with the explosion of this infernal weapon, the scientific conscience also exploded from the moral stresses which it had been piling up. The scientist was brought face to face with the fundamental question of our times, namely, the extent of his responsibility for the outcome of his own work.

Since the end of World War II, this debate has raged in the world

scientific community intensifying with the hectic pace of the scientific revolution. It has been taking place in a setting of increasing perils for humanity, with nuclear stock piles rising in the arsenals of nations and modern biology breeding lethal germs and gases in the laboratories and the environment itself becoming dangerously polluted by the thoughtless application of science and technology to human needs. The effects of science and technology have now grown so large and pervasive that they now touch every traditional concern of the politician, armament or disarmament planning for industry or agriculture, transport, education and health. For their Governments, both in peace and war, scientists are now worth their weight in gold (or the scarcer and more precious uranium) and they are familiar figures both in the corridors of power and the market places of social debate. The interaction between them and politicians, between them and administrators is becoming keener and deeper. Bernal, Blackett and Powell and Medawar are a far cry from the days when Isaac Newton elected to Parliament by his University of Cambridge sat out his entire term as M.P. in silence.

II

Scientists in India did not have to face up to these fundamental questions of human responsibility. Initially, they were the scientists of a dependent nation which had neither such fateful choices to make nor enjoyed a franchise in the counsels of nations which were making them. There was a kind of national war on during the early youth of Indian science. But Gandhi's movement pitted naked human flesh and spirit against armed might and did not therefore need their brains in the war effort. It was content with their distant adherence to the nations' hopes and aspirations. The great scientists of that early generation, by and large, led a life as untroubled with involvement as Isaac Newton. The rulers belonging to a nation which itself was in the vanguard of science respected and knighted them, while on the other side of the fence, their achievements boosted the self-esteem of their own people.

When the war was won, the vision of Jawaharlal Nehru invited Indian scientists into the corridors of power and the battle whether scientists should be on "tap or top" was largely won for them without the polemics which have raged in other countries. The first big stride in involvement of the scientist in national affairs had been taken. Shanti Saroop Bhatnagar and Homi Bhabha raised the new temples to our technological sovereignty in the shape of the National Laboratories and the great atomic energy complex in Bombay. Mahalanobis drew up the first blue print of Indian planning.

During the last two decades, the role of Indian scientists in the nation's developmental effort has steadily expanded. And the prospectus of Indian science is a promising document containing an inventory of goods it has already delivered to the nation, promises to deliver or is capable of delivering, unaided or on a dwindling scale of foreign collaboration. National Laboratories have claimed varying degrees of contribution to the drive for import substitution through gadgets or machines or processes large or small implying thereby how much more they could do if their resources were larger, their foreign exchange ration ampler, and administration more a pump than a brake. The Green Revolution has been the single biggest piece of vindication for Indian science while the enormous enterprise of Atomic Energy has been showing with increasing success that it is not an expensive sob to the vanity of a once-great nation refusing to opt out of the world's most advanced technology but has relevance to many of the bread and butter problems of India to the green revolution itself by providing isotopic tools for plant genetics, for food preservation, to medicine and to the wide and varied activities of exploration for oil and water and minerals.

By and large, all these claims of the scientific community in India are accepted by the Government and the nation. Scientists are increasingly associated with a wide range of national activities for development and reconstruction and rub shoulders with politicians and administrators in Yojana Bhavan and Udyog Bhavan and Krishi Bhavan and most of the other monuments to the post-Independence expansion of State activity in India. (Who knows one day one of them will arrive in Rashtrapati Bhavan).

With their influx into the corridors of power have come new issues of debate and discussion in the Indian Administration—the share of scientific and technological research in the national cake, the respective size of the sub-slices for science and technology, the priorities between various sectors of the research effort, the competing claims of indigenous and imported technology, the collaboration between Universities and Research Institutes and between Research Institutes and Industry, and the role of extension services in industry and agriculture. The priorities in science policy, the best infra-structure for science, the question of primacy between scientists and administrators, the conflict of young and old within the scientific community itself, the worth of scientists in the national wage scale and finally the Brain Drain as a barometer of success or failure to solve the foregoing problems.

These issues of contention are legitimate and vital for ensuring that

scientific and technological research in India is an ample, well managed and productive investment. The absorption of the scientific community in this debate is itself evidence of their involvement in the dominant concerns of the nation.

But national involvement is only an elemental commitment. Fundamentally, its psychological and emotional roots are the same as that of commitment to a tribe. Qualitatively, it is inferior to a deeper and social involvement in one's land and people. The difference between the two is the difference between the patriotism of Savarkar and the patriotism of Gandhi.

III

The more idealistic spirits of British and American and Russian science have now gone beyond national involvement to this deeper human and social involvement. It is not a matter of war or peace or armament or disarmament alone, but of far-reaching repercussions of technological innovation on the health and well being of their societies. They are now worried about some of the little things Gandhi worried about, like the state of sewers and drains and rising rubbish heaps in our cities and their larger implications in the contamination of the environment by man-made chemicals, the threats to the ecological balance in our earthly habitat by the headlong application of science and technology to agriculture and industry. By and large, Indian scientists have stopped short before these anxieties. They look at our steel plants with the pride of paternity but they ignore the slag heaps nearby though they are as much their progeny. And if their chemical ingenuity can compound a wholly indigenous detergent, they feel fulfilled but not worry about the foam which rebounds to the people through the tap water *via* the foamy river.

Basically, their concept of national fulfilment is faulty. Indian scientists like the rest of the Indian intelligentia believe that if India can duplicate the industrial revolution in Europe and the United States, she would fulfil herself. Little do they pause to think that the blessings of this revolution have not come to the advanced nations unmixed and with more social involvement and with more forethought the mistakes of the industrial revolution can be avoided in our own development. Partly their failure to think in terms of the social and human repercussions of technological progress is due to their social origins. They are part of an intelligentia which lives on domestic servants at home and on a profusion of peons and technical attendants in offices and laboratories. Gandhi alone among our leaders was quick to put

his finger on this weakness of the Indian intelligentia. And it was in order to teach them involvement with people that he made ex-Harrow and Cambridge boys like Nehru squat on the floor and ply the spinning wheel. And it is for this same cause that the new urban Mandarinates of China are feeling on their backs the lash of Mao Tse Tung's whip driving them to the villages.

The effects of science and technology have now become so large and pervasive that the scientist cannot merely stop with the gadget or the process created by him and wash his hands off all other responsibility for it. The consequences of his creations affect all fields which have been the traditional concern of the politician or the administrator. Almost no field of thought or action which Robert Hooke asked him to eschew in the exortation quoted at the beginning of this article can be out of bounds to him.

Take any gadget of modern technology and we can see how far and wide are its repercussions on our lives. Take the automobile. We gaze with envy and admiration at the mass motoring communities of the West among whom the birth rate of motor cars is vying with the birth rate of babies. But it is not such an unmixed blessing to these car borne societies as we imagine. There are millions of road casualties every year on the highways of Europe and United States. The social cost of these casualties in terms of loss of man-days of work and hospitalization comes to staggering sums. The mounting toll of deaths and lethal injuries is no longer a problem for policemen and traffic controllers alone but a multidisciplinary concern of traffic controllers, road engineers, sociologists, psychologists, statisticians, electrical and design engineers. There are compulsive associations of motor driving with youth, potency, adolescent exhibitionism, correlations between a history of repeated accidents and broken homes, childhood phobia, truancy, sexual promiscuity and criminal record. And thanks to the great blow for humanity on the roads which was struck by Ralph Nadar in the United States, it is now accepted all over the world that there is a direct connection between road accidents and the design of motor cars.

Clogging the vital arteries of cities, the motor car has also become a problem for architects and civil engineers. Cities have to be torn apart to accommodate the unending influx of motor cars, and the beauty and grace of inherited architecture is often a casualty. It has revealed itself as one of the biggest pollutants of the urban environment. It has rendered the air of cities carcinogenic, lodged nearly toxic levels of carbon monoxide and lead in human bodies and contributed significantly to the pollution of surface waters. In the United States, it

has been observed that vegetation within at least 100 feet of trunk roads tends to get contaminated by lead and chromium.

Both scientists and governments in the advanced nations are acutely conscious of the hazards to life and health the motor car has brought. But they have gone too far on the road to turn back. The vested interest of a vast and powerful car industry comes in the way of rational solutions. In order to reduce pollution and congestion, Governments must restrict the use of motor cars in cities. This, in turn, contracts the home market, which cuts down production, creates unemployment in industrial areas, and thereby endangers the electoral chances of the party in power. The compulsory incorporation of safety features in motor car designs puts up sale price, inhibits competitive ability in export markets with adverse effects on the balance of payments.

Thanks to the privilege of our backwardness in history we are writing on a clean slate. But we do not take advantage of the choices which are still open to us. The small car is the dream of every babu at present riding his bicycle, a dream whose realization is imminent. But no Indian scientist has raised the vital question of social choice in this field. Shall we make more cars in our land or more buses? And if automobile plants have to go up, shall we not insist on those features of safety in car design which have been developed after the experimental crashing of hundreds of cars in the laboratories of Europe and the United States, things like a collapsible steering column, energy absorbing front and rear end structures, solidly anchored seats, reliable door latches and hinges, combination of harness and lap belts and anti-pollutant devices to filter out exhaust emissions? Or should automobile research in India (whenever it begins seriously) leave out the internal combustion engine and go on to work on the steam car or the electric car. No Indian scientist has raised these issues. Incidentally, even U.S. science did not produce another Rachel Carson to strike the blow for human safety on the roads. Ralph Nader was a lawyer.

IV

We may look at another area of the application of science and technology in which the immediate results are very spectacular. It is a fact that our agricultural break-through owes a great deal to nitrogen fertilizers. But it is also a scientific finding that the addition of inorganic nitrogen fertilizers suppresses natural nitrate fixation so that you need more and more of it to maintain productivity of the soil. In an address to the Soil Association in London recently, Professor Barry Commoner of the Washington University said that American farmers

"are hooked on nitrates like a junkie hooked on heroin". Commoner warned that "within the next 25 to 50 years the major agricultural areas of the United States will reach a point of no return. Either the productivity of the soil will deteriorate or massive doses of nitrates will have to be added so as to cause insoluble pollution". This again may not be an immediate prospect for us, but it cannot be so distant either. We all know how green is our revolution in the countryside but one would expect an Indian Commoner to tell his people how permanent it will be.

The world is increasingly racked with anxiety about environmental contamination by pesticides and everywhere it is the scientists who have raised the alarm. The organo-calorine pesticides are found to leave residues in the soil for months and even years. They are spread by rivers and winds and creep up extended food chains because of their tendency to accumulate in the fat of animal tissues. The worst culprits are D.D.T., Aldrin, Dieldrin and Lindane. They have been found toxic to fish in the rivers and wild birds, large populations of which have been decimated. Sometime back it was reported in Britain that Dieldrin used in an isolated field as a sheep dip appeared years later in reservoir miles away retaining all its toxic properties. There appears to be nowhere in the world totally free from traces of organo-chlorine pesticides. Traces of these have been found even in the Antartic. D.D.T. even from moth-proofed clothing can percolate through the skin and the body fat. It has been found that D.D.T. in a body can stimulate the activity of enzymes in the liver which are responsible for regulating certain hormones. The "Which" magazine, organ of the Consumers Association in Britain, recently announced its finding that D.D.T. in home fly killers did not lose its power for years to come. In Britain every man or woman carries two or three parts per million of D.D.T. in his body. The concentrations are four times as great in the United States where it is said that the build up of D.D.T residues in human bodies is reaching a level at which Americans will not be fit for eating (by cannibals).

From Sweden, a scientist reported to W.H.O. that mother's milk in Sweden contained more than twice as much D.D.T. as is allowable in commercial milk. Sweden, Denmark and Holland and several States in the U.S.A. have already banned D.D.T., while in Britain the Government's Advisory Committee on Pesticides is urgently considering its prohibition. Britain's policy is for a phased withdrawal of organo-chlorine pesticides but the Scandinavian countries have already banned them.

Government in India are to some extent seized of the problem but the scientific community of India have raised no debate on it, have posed no alternatives. Are there no alternatives? Would not organo-phosphorous insecticides do for certain crops as they are not persistent? Are not there sectors of pest control where we could use biological methods by introducing predators to prey on the insects which devastate our crops? Must we use D.D.T. as a fly killer? Are not pyretherum sprays as effective and less harmful? And pyretherum grows in the valley of Kashmir. No layman can either raise these questions or answer them. It is for a socially responsible scientific community in India to raise these questions on behalf of the Indian people and help their administrators to answer them.

The pollution of rivers, lakes and coastal water by effluents from farms and factories and city sewage is also a by-product of technological advance. In all industrial communities it is assuming dangerous proportions. The Rhine for a long time has been called the Sewer of Europe. One day in June the population of both Holland and Germany trembled when a tidal wave of dead fish was seen floating down the river ahead of a contaminated stretch of water. It was soon discovered that a consignment of the insecticide Endosulfan from the Hoechst Company's plant on the Rhine had accidentally dropped from a river barge and the poison was floating down the river. For several days the Dutch were badly scared. Water supplies from the Rhine were cut off and Dutch cities switched to emergency reservoirs. Twenty-five million fish in the Rhine died during those few days.

In 1930, a Swedish Mining Company dumped 7000 tons of arsenic which had accumulated in the Baltic. These are still at the bottom of the sea with their concrete containers eroding away. No one can say what will happen when the Arsenic finds its way to the waters round the Baltic coast.

These are the environmental perils with which industrial societies live and these are the perils which we will have to face increasingly with technological advance. But they are avoidable, and the defences against them are also devisable. But only if Indian scientists thought of the Ganges when they hear of the state of the Rhine, thought of the stretches of this great river so celebrated in our song and story and religious lore near Kanpur where the city's tanneries and textile mills discharge their effluents. What are the detergents which the textile mills are using for washing their yarn or wool? Are they dedecyl benzene sulphonates, or are they "alkyl benzene sulphonates", with straight and not branched alkyl chains. These terms are a mouthful for a

layman like the present writer except that he roughly knows that the first is very foamy and cannot be easily broken down by bacteria in the water, while the other is highly bio-degradable. This could lead the Indian scientist to ask whether there are any strict standards of bio-degradability laid down by the Indian Standards Institution for industrial detergents. And the larger question about legal controls on river and sea pollution. How many Clean River Acts are on the statute books in our country and is it not high time they were? What are or should be the penalties? Even in England these penalties are a joke. A maximum penalty of twenty pounds leviable under British anti-pollution laws is only a pinprick to an industrial offender in Britain who would rather pay the few pounds than spend thousands on more careful treatment of his factory effluents.

Both the development of pharmaceutical research and the growing manufacture and import of drugs in India poses the same problems of the quality control of drugs which have led to the establishment of the Dunlop Committee in this country and for stricter supervision by Government over all the processes by which a newly synthesised drug emerges from the laboratory. The hideously deformed Thalidomide children in Germany are still the grim symbols of social irresponsibility of some drug chemists.

The new revolutionary techniques of spare parts surgery and heart and kidney transplants are raising complex problems of ethics, morality and religion. These too, will soon be with us. The break-through in reproductive physiology promises to raise a new set of fundamental sociological issues and alter the relationship of men and women. The gadgetory of modern electronics has not only made great feats of industrial automation and the storage and retrieval of information possible but poses new threats to fundamental rights of privacy and personal freedom. The computer designed to store the medical data of every man and woman in this land could well develop into an omniscient "Big Brother" under a Fascist dictator. On the other hand, the break down of personal privacy by electronics could also compel men to live their lives like a Gandhi in broad daylight and under the full gaze of their fellow men. It is again for the scientists to gauge the balance of probabilities.

V

Over a vast and growing area of our development it is the socially responsible scientist alone who can pose the right questions and help in finding the right answers for the safety, health, welfare and the

liberties of our people. In order to do so, he would have to be like Francis Bacon taking all knowledge for his province and unlike Robert Hooke refusing to meddle with all areas of human thought and activity except "the knowledge of all natural things".

If we are at the "take-off" stage of development now, we are also on the threshold of these problems. From the "tap" he would much oftener go to the "top" in the coming years. Segregation between scientists and administrators is breaking down. In Britain, as a result of the Fulton Commission's recommendation parallel and separate hierarchies of administrators and technical civil servants are being broken up in several ministries and replaced by a unified system in which each block of functions could be directed either by a scientist or an administrator.

But as they reach these eminences scientists should not forget the dangers of scientific alienation. Such alienation comes when you have spent long years in shuttling men and money and paper. Social alienation also comes at these heights when you have ceased to confront social realities face to face and establish relations with it through pieces of paper.

BASIC AND APPLIED RESEARCH IN A DEVELOPING ECONOMY

V. G. Bhide

WE are essentially living in an age of science and technology. What is new and characteristic of the contemporary world is the explosion of rising hopes and aspirations for economic betterment, for education and for national development on the part of hundreds and millions of people in countries which after centuries of subjugation have in the last few decades or so obtained their political independence. Many of these countries which are sometimes referred to as under-developed or less developed countries have great traditions and highly sophisticated culture, but almost all of them have underdeveloped economy still at a level of mere subsistence and that agriculture is still exploited using ploughs, unselected seeds and methods that go back to middle ages. These have been great civilizations in the past but in all of them the people except for negligible minority live in ignorance, squalor and poverty. The present day world is science based and in this there can conceivably be no going back unless civilization itself suffers a total eclipse because of man's folly or inability to deal with the human way that is in the true interest of mankind.

There have been examples where countries which were few years ago underdeveloped have shot up into the class of developed nations by the proper utilization of science and technology. Although no correlation exists between the outlay on research and development and the rate of increase of gross national product, yet it is almost obvious that in order to have real increase in the gross national product it is necessary to employ and harness scientific knowledge and technological achievements. Indeed a basic distinction between traditional and modern societies is the development and use by the latter of science and technology which helps modernization of agriculture and the development of industries. In a traditional society production is based largely on empirical processes and experience, on trial and error rather than on science. In a modern society, however, it is basically rooted in science. The electrical industry was probably the first to become science based, next came the chemical industry and now in industrialized countries agriculture is fast becoming a branch of applied science. This close interlocking and

interdependence between science, technology and industry is a characteristic of the contemporary world. In recent years, several countries have been able to raise their GNP very rapidly because of the rich investment in science, technology and education. Japan's is a classical example. It is with wise and judicious use and balance between the imported and the indigenous know-how that Japan has been able to increase its GNP during the last 10 years at a remarkable rate of 10 per cent. Although the outlay on research and development in Japan is much less than in UK, the rate of increase of GNP in Japan is almost three times than what it is in the UK. This is in itself a pointer to the developing nations and brings forth the basic fact that science and technology have become instruments of national development and reconstruction.

Pure science is concerned with the discovery of new facts and with the understanding of nature. This endeavour is not affected by an expectation of practical applications. The value of pure science may be explained in two different ways. On the one hand pure science has intrinsic intellectual value. On the other it may be pointed out that most of the important practical applications have resulted from scientific discoveries that were originally pure. Indeed it has now been well recognized that today's science is tomorrow's technology. Apart from the direct technological achievement that necessarily flows out of pure science at a future date, pure science sets the tone and temper in technological achievements. Indeed a look at history will show that those countries which were industrially advanced were also the centres of good pure research. In the beginning of this century the industry flourished in Germany and it is essentially here that we had such stalwarts in pure science, such as Heisenbergs, Einstein, Schrodinger, etc. Then the centre of gravity shifted to England and now it is in the United States. It is in the United States that industrial development is at the maximum and so also it is here that good pure research is carried.

Professor P. M. S. Blackett in his second Nehru memorial lecture mentioned about the innovation chain which starts with the conceiving of an idea, development of the idea and then the product and the process based on the idea, exploitation of the product and the process know-how, drawing, design, sales, after sales service, etc. There applied research occupies an intermediate position between pure research on the one hand and industrial production on the other. However, it may be mentioned that applied research cannot flourish without its interaction with pure science and with design engineering on the other. It is, therefore, very essential that this link between pure science and applied science should be maintained, strengthened and fostered. One of the

ways of fostering this link is to have closer collaboration between universities where basically pure research is carried out and the industrial research laboratories, which attempt to carry out applied research.

Applied research is an eminently creative field. It is not the amount of creativity but its direction that distinguishes it from pure research. Many of the methods employed in applied research are the same as those practised in pure research, but there are differences. A project in applied research very often requires the cooperation of efforts from many different fields. This imposes a different type of work. It is also quite frequent that applied research projects are tied more closely to a time scale than are undertakings in pure research. However, imagination and invention play similar roles in the fields of pure and applied research.

In view of the rising expectations of millions of people for their betterment and even satisfaction of their basic needs, it is imperative that in a developing economy applied research which is designed to production of wealth in the country, has necessarily to be given higher priority. The success of applied research, leading to the creation of wealth in the country is conditioned by several factors, such as: (1) the generation of idea, (2) evaluation of idea or selection of an appropriate project, (3) the conduct of the project, and (4) the translation of the ideas which have resulted out of the applied research into industrial production. All these steps are equally important.

The first important factor in the successful working of applied research is obviously the selection of suitable projects. In several advanced countries applied research is done in the industry itself and the selection of suitable project does not present a formidable task. Indeed a recent survey of some 30 big industrial concerns in the USA carried out by Dean has shown that most of the projects are either internally generated or fed by the consumers or salesmen. In developing countries, industry is not that enlightened and it does not consider it profitable to spend a substantial amount of research and development. In fact, in most of these underdeveloped countries, such as in India, applied research is intended to be carried out in Government laboratories such as the CSIR laboratories. This divorce of applied research from industry presents very serious problems particularly in times of the selection of potentially profitable projects and the translation of ideas generated in applied research in respect of the product or the process know-how into industrial production.

More often than not, there is no agency which feeds problems or

projects to these laboratories which almost work in isolation. In most cases the scientists in these laboratories in the absence of any guidance from industry select projects based essentially on their wisdom and experience and not so much on the data relating to its pertinence, potentiality, etc. Some of these projects have proved successful but by and large this way of selection of projects has not proved very satisfactory and in fact this accounts to a large measure for the inadequate returns from our outlay on research and development.

Various remedial measures have been suggested time and again to bring the national laboratories in close collaboration with the industries. The Minister for Industrial Development and Company Affairs has recently suggested that the industries should by legislation be forced to take up the research and development in their own line so that the later version of the technology could be developed here itself. The Minister for Education and Youth Services has recently suggested that it may be a good idea to classify four major industries in the country in terms of the various national laboratories and then bring the respective national laboratories in close touch with the industry. It is hoped, this marrying of industries with the national laboratories would to a great extent solve the problem of feeding the national laboratories with appropriate projects.

In most of the developing countries, the industry is essentially based on the imported know-how. The borrowing of the know-how as is presently done creates certain problems and indeed isolates the national laboratories from the industries. It is not infrequent to find that an entrepreneur based on his experience and wisdom enters into a collaborative agreement with outside agency for setting up the production of a particular item. This is seldom on the outright sale basis but in most cases the know-how is borrowed on the basis of certain percentage of royalty, which can to an extent be repatriated out of the country. It is obvious that the imported know-how is never the latest know-how and since our industries themselves do not have their own research and development organizations, and furthermore these industries have no liaison with the national laboratories, no further research and development on the imported know-how is either attempted or attained. Consequently, the industry has to run again and again to the foreign concerns for the later version in technology. In those industries, such as, for example, electronics industry, where the time of obsolescence is very small, this presents really serious problems. In this process the imported know-how gets locked up within the four walls of the entrepreneur and the country as such does not drive any benefit. The situation is further

aggravated as the same technology is borrowed by several concerns from different foreign sources with the resulting problems of standardization, spare parts, etc. It is at the same time obvious that most developing countries cannot do without importing the know-how in certain fields if they want to develop rapidly. Even the most advanced countries import know-how. Indeed the import of know-how by USA has been increasing during recent years. There is consequently no escape from the know-how but the real problem is how to assimilate this know-how and develop later versions of technology. One of the ways of solving this complex problem may be that in the collaborative agreement it may be provided that a national laboratory depending upon proximity, expertise, etc., will be associated with the borrowed know-how. Once this is done the national laboratory could then be charged with the responsibility of carrying out further research and development in that field. This will obviate the difficulty of finding suitable projects at the national laboratory, ensure research and development in relevant field and bring industry closer to the national laboratory. It may be argued that in the event a national laboratory is associated with the borrowed know-how, the interests of the entrepreneur will be jeopardized. I am happy that the Ministry of Industrial Development and Company Affairs has successfully tried to remove the secrecy clause from the collaborative agreement. Once the secrecy clause is removed then such an argument will no more be valid. Secondly, one has to look at this problem from a broader perspective and of national interest. In the present circumstances the individual, *i.e.* the entrepreneur is taken care of at the cost of the nation in the sense that the borrowed know-how remains locked up within the four walls of the entrepreneur and the country as such does not get any benefit. In the alternative suggested above it may act against the interest of the individual but at any rate the country could benefit in the sense that the national laboratories would be associated with the imported know-how and then would be able to take up the research and development in that particular field expeditiously. This will also obviate the possibility of running again and again for the later versions of technology. It may be possible even to safeguard the interests of the individual by providing certain remedial measures against the leakage of the know-how to his competitors. These are of course matters of detail and can always be worked out. By this method the national laboratories can be brought in close contact of the industrial problems so that they would not be working in isolation.

One may argue this point from yet another angle. There is a well-accepted maxim, that is "to preserve one's health one should not eat more than what one can digest. It is equally true in respect

of use of sophisticated instruments and that is one has no right to use a sophisticated equipment unless one knows how to maintain. It is equally true in the case of imported know-how. In this field, the solution is of course not to import the necessary know-how but to create conditions whereby this know-how can be assimilated and improved. In order to do this, it may even be necessary to see that a strong research and development group is formulated in the field even before the technology is imported. This is again the same philosophy that adequate provision for research and development should be made to capitalize and improve the imported know-how in the interest of the country.

Another problem that is faced by applied research is that in most cases the ideas developed in the applied research cannot be translated into industrial production because laboratories cannot give a turn-key job to the industry. Although it may be agreed that the laboratory should give the know-how and give the process guarantee, the laboratory cannot do the necessary design and construction of an industrial plant to translate the ideas emerging out of applied research into full scale industrial production. This gap has necessarily to be filled in either by an industry itself or by bringing in at suitable stage the competent design engineers into the picture.

In conclusion, it may be said that in developing economy the primary thing is to create a realization in the country that unless science and technology are harnessed properly and efficiently, economic betterment cannot be achieved. Secondly, it is equally important to forge closer links between pure science, applied science and technology. In terms of institutions, closer collaboration should be established between universities, national laboratories and industrial undertakings. It is only when such a rapport is established, science can prosper and the expectations of millions of people who have been eagerly waiting for years and suffering from want, poverty and disease, can be fulfilled. It may be necessary to state that this should be done soon otherwise the faith of the common man in science will be lost.

ORGANIZATION, MANAGEMENT AND PROGRESS OF INDUSTRIAL RESEARCH IN INDIA

K. Sreenivasan

ONE of the basic factors about Industrial Research in India is that it is largely Government financed and managed. Apart from a few laboratories established by private companies and some industrial research associations sponsored mainly by the textile industry, almost all industrial research is carried out in the national laboratories established by the Council of Scientific and Industrial Research (CSIR). In the advanced countries of the West, industrial research is carried out largely in laboratories of private companies. While the laboratories run by the state may undertake research of a general nature, research for the solution of the specific problems or for the development of processes or products is undertaken by private laboratories, and there is often great competition between different manufacturers to perfect a product or process through research and development ahead of their competitors. On the other hand, in socialistic countries such as the Soviet Union, research as well as industry is state managed, and the state-run laboratories work in very close co-operation with state-run industries. India is the only country where industry is largely in private hands while industrial research is almost entirely state-managed and financed. This peculiarity, which is partly the result of historical circumstances and partly the result of the level of economic development, must be taken into account in any consideration of the progress of industrial research in India.

Industrial research in an organized way may be said to have commenced in India with the setting up of the CSIR as an autonomous body "for the purpose of fostering industrial development in the country", mainly through the promotion, guidance and coordination of scientific and industrial research. The objective was sufficiently broad-based in order to give the organization flexibility in its operation and to enable it to adjust itself to changing needs and circumstances as industrial development proceeded and as the momentum of research acquired greater acceleration. Such flexibility is a great asset to an organization serving broad, long-term, national objectives.

From its modest beginnings the growth of the CSIR during the past 27 years has been very impressive. From two laboratories in 1947

the number has grown to 30 at present. They cover a wide variety of disciplines as well as commodities. In addition, the CSIR has been instrumental in setting up and aiding a number of cooperative research institutions for various industries. From less than 400 scientific and technical personnel in 1950 the number has reached nearly 10,000 at present. In terms of expenditure, beginning with a grant from the Central Government of about Rs. 11 lakhs it has today a budget of about Rs. 20 crores. A large number of scientific and technological papers have been published in reputed journals in India and abroad and a number of patents have been taken out. A considerable amount of research has also been sponsored by the CSIR in other organizations such as universities.

Therefore, the past 20 years can be considered as a period of rapid expansion and growth. The rapidity of expansion through an increasing number of laboratories and multifarious disciplines has brought in its wake a number of problems. The laboratories have, generally speaking, been feeling their way and their approach to industries has been lukewarm rather than whole-hearted, except in a few cases. The time and resources of the scientists and science administrators have been utilized on the problems of expansion rather than of research and its application to industry. Only in the last few years has this objective been seriously considered.

When the CSIR was first established, a number of administrative procedures and rules and regulations were laid down for the orderly growth and development of industrial research as well as for the control of expenditure, purchase of equipment, recruitment of staff, and so on. While there have been minor changes in these procedures from time to time, the basic structure has remained unaltered over the past 20 years. But in the mean time, the organization has grown considerably. Consequently, while effective control from the Headquarters has become more and more difficult, the scientists in the laboratories have been feeling that the rules hinder them in carrying out their work and fulfilling their objectives effectively. There is perhaps a need for some rethinking on these procedures in order to ensure, first, that in matters of scientific and research policies the Directors and other senior scientists have freedom of operation, and secondly, that those responsible for expenditure are fully accountable. The Sarcar Committee may be expected to consider this problem in their report.

The work of the CSIR has been reviewed by three committees—the first one in 1947, the second in 1954 and the third in 1964. While the first Committee did not recommend any specific division of

expenditure on fundamental and applied research, it emphasized the need for applied research that would be directly useful for the industrial development of the country. It drew attention to the fact that "owing to the absence of facilities for pilot plant work, processes have been given out to industry in half-baked condition with the result that many industrialists find themselves unable to try them to a practical and profit yielding stage". The second reviewing committee emphasised the need for closer relationship between CSIR laboratories and the universities and drew attention to branches of science which could be helped to advance. The third reviewing committee stressed the need for developing a major portion of the effort towards applied research which would be directly beneficial to industrial development and suggested that pure, fundamental research could be left with the universities. The committee also emphasised the necessity for taking effective steps for the utilization of research results and recommended that investment in industrial research will have to be increased many times and should be limited only by the availability of trained personnel and resources. They considered that research projects should have definite objectives with specific time targets and should be closely related to the process of planning.

In the early years of the formation of the CSIR, it was assumed that when once the research laboratories were established and they started functioning, their contribution to industrial development would be significant and more or less automatic. Perhaps the nature of relationships and the organizations that are necessary in order to bring about a rapid application of scientific knowledge to industrial production was not realized at that time. Recent experience in India has clearly indicated that lack of such relationships can be a great handicap to the application of science to industrial development.

The relationship between the growth of science and industrial development is a complex phenomenon. It depends on the relationship between laboratories and industries, on the existence of a suitable socio-economic climate in which there is an increasing desire for the use of scientific knowledge to industrial production, the social compulsions that act on the scientists and industrialists and the organizational pattern for the conversion of scientific knowledge to usable form. Great Britain has perhaps produced more Nobel Prize winners in pure science in relation to its population than any other country. But while Britain has been pre-eminent in science, she is economically and industrially not in a very strong position. On the other hand, Japan, which does not have any claims to pre-eminence in science, has been highly successful in the use of scientific knowledge for industrial growth. The

conversion of scientific knowledge for industrial development depends first and foremost on a clear definition of specific technological objectives and a realization of the need to fulfil those objectives; secondly, on the development of processes, and their objective evaluation and the necessary engineering skill to build pilot plants and prototypes. Finally, it also involves the desire on the part of industrialists to invest money in indigenous processes even if there is an element of risk.

Unless all these requirements are satisfactorily met the transfer of scientific knowledge to problems of production is bound to be slow and halting.

In recent years there has been some criticism of the role of science in India and its contribution to industrial development. It has been suggested that science in India has failed to meet the needs of the nation in terms of the development of technical know-how and self-sufficiency in scientific aspects. It is necessary to examine this criticism in some detail and see where the fault lies.

In the first place, the CSIR has to maintain more than thirty laboratories of diverse disciplines, products and industries. In addition, it is providing financial assistance in the form of grants-in-aid to cooperative research associations, fellowships in universities and colleges, and so on. While investment in industrial research has been increasing steadily, nevertheless, the resources at the disposal of the CSIR are totally inadequate to meet all these needs. On the other hand, even if the resources were doubled, it is extremely doubtful if any significant contribution to industrial development can be made.

This is because, no allocation of priorities has been made at the highest level. Even if the resources were much greater, it is difficult for science, particularly in an underdeveloped country such as India, to make a significant contribution to all aspects of economic and industrial activity. It is, therefore, necessary that certain priorities should be allocated taking into account the economic and social needs of the nation and the critical areas in which it is necessary to attain self-sufficiency at the earliest possible opportunity. Such a decision on priorities cannot obviously by taken by scientists. It will have to be done at the highest political level.

Having taken a decision on priorities, adequate funds should be made available for those priorities to be fulfilled within specified time-targets. All other demands should be rigorously left out or postponed

until such time as additional funds are available. Only such a rigid allocation of priorities and funds on that basis would enable scientists to have specific objectives which they can pursue without other diversions.

Scientific research in the Soviet Union is an instance of the allocation of such priorities. They have allotted priorities for space research, nuclear physics and computer technology. Massive investments have been made in these areas in terms of talent and resources in order to reach existing or even higher levels of technology than in the United States. But in almost all other areas, research has been given secondary importance and can be considered to be ordinary when compared to other advanced countries. A similar policy with regard to the selection of a few areas to the exclusion of others is essential if science is to make significant contribution to development in India.

The lack of priorities at the highest level permeates down to the laboratories also. A large number of laboratories have been established in the past and new departments set up within them without any serious consideration of their functions in relation to industry and without giving them specific, industrial research targets. Similarly, within each laboratory, departments are created, again without reference to the industrial needs but more because such departments exist in similar laboratories elsewhere in the world.

The second factor which has been responsible for the poor contribution of science to industrial development is the intellectual and social distance that separates our laboratories from industrial organizations. Traditionally, industries in India have tended to rely on foreign technical know-how and the last twenty years had, if anything, increased this reliance. While it may be necessary to depend on foreign technical know-how for certain areas, it is also essential for industries to make use of indigenous know-how where possible and it is essential that our laboratories should be used for the purpose of servicing, consultation and further development. In spite of various sporadic efforts made from time to time, the social distance that separates our laboratories and our industrial organizations is still very large. Many of our scientists have an academic approach to problem and do not carry out their studies in depth sufficiently in order to make their results meaningful from the point of view of commercial exploitation. There is also a reluctance on the part of many scientists to enter the industrial field for consultation and test their knowledge against the touchstone of technological and commercial success.

When certain processes have been developed in our laboratories, there is at present no means of assessing the commercial potentiality

of these processes or their value in terms of national economy. Often, it is a matter of dispute between scientists in the laboratory on the one hand and industrialists who may be manufacturing the product by an imported process on the other. Lack of research and development departments in industries is a great handicap in this respect. Creation of suitable machinery for the objective evaluation of such processes in terms of national requirements is very essential and in the case of those processes which are considered commercially viable, development should be carried right through to commercial manufacture by a company either in the private or in the public sector. This lack of facilities for evaluation and exploitation is another factor that has been inhibitive to the effective functioning of our laboratories. In actual fact, what has been happening is that a number of laboratories have set up small pilot plants and are participating in what may be described as manufacturing activities. This tends to take away the time of the scientist to the detriment of his scientific pursuit. It also means that problems of industrial relations, purchase and sales, and so on, which should not normally be the functions of scientists have to be carried out by them.

Another aspect that is of relevance to the application of industrial research is the large number of collaboration agreements that have been entered into between Indian industry and foreign companies for the supply of technical know-how. Many of these collaboration agreements contain a clause for passing on further developments also to the Indian company. This means that industries started with foreign collaboration do not invest money in research in India, but the royalty they pay helps to subsidize research in other countries. They do not do even minor investigative work as all such work is given to foreign technical experts who are readily available for the purpose. Therefore, these industries do not pose any scientific or technological challenges to scientists within the country. Because of the large number of such agreements, industries have not made use of whatever scientific talent is available within the country. Not faced with meaningful, industrial problems demanding urgent solution, our scientists have tended to concentrate in the past on problems of an academic nature. If meaningful use is to be made of industrial research within the country, there should be close integration and coordination between imported know-how and indigenous development.

Consultation is a vital and necessary part of any industrial laboratory work in that, it brings a scientist in close contact with the industry and enables him to understand and appreciate the problems of the industry and thus makes his research more realistic and meaningful.

It also enables the industrialists and the engineers to have greater confidence in the scientist and makes them more receptive to the results of research and it helps in immediate improvement in productivity or quality of the industry concerned. Therefore, consultation should be a vital and necessary part of any industrial laboratory. One of the reasons for the close relationship that exists between research associations and industries is due to the large amount of consultation they are called upon to undertake.

To conclude, during the last 25 years, we have succeeded in building up a strong infra-structure of industrial research mostly through the auspices of the CSIR. But its contribution to industrial development has so far been marginal. If this contribution has to be significantly increased, it is necessary that certain priorities have to be selected and massive investment made in those areas. Research within individual companies has to be increased considerably and there should be some means of objective evaluation of the results of research from a commercial point of view. There should be close coordination between imported know-how and indigenous development. Finally, laboratories should play a far greater role than they do at present in providing consultation and services to industries. Apart from other benefits this will reduce the social distance that separates them at present.

COOPERATIVE RESEARCH IN INDIAN INDUSTRY

P. C. Mehta

THE importance of research for industrial development has been widely recognized in developing countries largely from observations of the substantial contribution that research has made to industry's progress in the developed countries. One of the difficult problems in developing countries is to determine the most effective method of research organization which would maximize the returns from the rather limited expenditure that these countries can afford to incur on research. A variety of organizational forms is prevalent in the developed countries for industrial research. Each of these has definite advantages and limitations and has therefore to be carefully examined especially in the context of the conditions commonly found in developing countries. The following can be considered as the major and most widely adopted forms of organization of industrial research:

1. *Research as an Integral Part of the Industrial Unit*

It is generally agreed that industrial research is most effective when it is undertaken by industry within industry. In other words, research and development is accepted as one of the several important internal functions of the industrial organization. In this set-up, the research department would have frequent and close interactions with the production and marketing function of the organization. This is important for a critical and realistic appraisal of research needs, for assessment of the commercial value of research results and for promptly scaling up promising research results from the laboratory and pilot plant level to the full commercial scale. On the other hand, establishment of a full-fledged research and development laboratory is today quite expensive and may be considered to be beyond the needs of many individual industrial units in developing countries.

2. *Private Research Organizations Undertaking Contract Research for Industry*

In many industrially advanced countries, especially in U.S.A., there is a recent trend towards setting up of private business

organizations for undertaking industrial research on a contract basis from Government and industry. This system provides highly specialized research facilities to industry without having to make permanent commitments for expenditure. Exclusivity of research results is of the same order as would be obtained if the research laboratory was an internal department of the industry. Contract research, however, would generally be expected to be more expensive since the research sponsor will not only have to bear the direct and indirect expenses for the research but also have to contribute towards the profits of the private research company.

3. *Cooperative Research*

In some countries, a system of organization in which one research laboratory caters to the needs of several or all units of a particular industry in that country has been found to be attractive. The expenditure for research is obtained either through a tax or a levy on the industry or through a membership fee from individual units within the industry. In the former case, all units of the industry compulsorily contribute towards expenses of the research organization and in return are entitled to get the benefits of research. In the latter case, on the other hand, participation in such a joint research activity is voluntary and the services and benefits of the research organization are limited to the participant companies. Strictly speaking it is only the latter which can be classified as cooperative research though for all practical purposes there is not much difference between the two forms of organizations. The main advantage of this organizational form is centralization of research facilities, consequent economies in expenditure, and maximum utilization of limited specialist manpower for the benefit of the industry.

4. *Government-run Laboratories*

In this system, the Government entirely finances the research organization and is directly responsible for its management and control. While the circumstances obtaining in many developing countries may make this form of organization as the inescapable choice, a major difficulty likely to be encountered with it is the problem of establishing effective communication with industry.

Which of these different systems would be most appropriate for industrial research in developing countries? It may perhaps be more pertinent to ask which of these systems would be feasible since the choice would depend not only on what is considered to be the most desirable

alternative but also on what would be capable of implementation. In considering this question, it is necessary to compare briefly the general conditions in which industries operate in the developed and developing countries. It is merely a platitude to state that industry will spend on research when it feels the need for such expenditure and believes that the return, immediate or long term, from the expenditure, would justify it. Unless the economic conditions in a country are such that research becomes essential for the growth and perhaps even survival of the industry, it is unlikely that industry would, at its own initiative, spend money on research. It is here that one finds a significant difference between the situation in the developed and the developing countries. In the former, competition, both national and international, is severe, demanding constant efforts to reduce costs, improve quality, develop new products, change designs, etc. The rates of obsolescence associated not only with capital goods but also with consumer goods are extremely high in affluent societies. This arises from and results in continuing efforts from industry for newer and better products, preferably at lower costs. This constant and pressing demand on industry from its consumers makes it almost obligatory for the latter to undertake research in one form or the other if it is to satisfy these demands in order to stay in business. On the other hand, in the developing countries, the markets for various industries are generally assured because of rising populations and standards of living at a rate faster than that of industrial expansion. This sheltered market economy is further strengthened by various tariff restrictions which are commonly used by most developing countries to foster the growth of indigenous industry and protect it against competition from industries in the developed countries. Furthermore, the average size of industrial units, barring a few exceptions, is significantly smaller compared to that in the developed countries. Also, in many of these countries, modern industry is relatively recent and therefore does not have the traditions of established industries in the developed countries. Under these conditions, industrial research does not become a compelling necessity for industry in the developing countries to survive or even to grow. It is, therefore, unlikely that industry by and large would be willing to spend on research on a scale anywhere comparable to that in the advanced countries.

The first two alternatives for research organization listed earlier would therefore appear to be not practical or feasible in the vast majority of cases in developing countries. The choice is thus restricted to either cooperative research or to government research. In fact, more than 90 per cent of the industrial research effort in India is organized in one of these two forms.

II

HISTORY OF COOPERATIVE RESEARCH IN INDIA

The concept of cooperative research started in India with the Shanmukham Chetty Committee appointed by the Central Government. This Committee recommended that to encourage industry to set up research it should not only be given suitable tax concessions for research expenditure but should also be given direct financial assistance if it was willing to establish cooperative research associations. These recommendations were accepted by the Government of India in 1945-46. The Textile industry of India was the first to take advantage of these facilities offered by the Government and within the period 1949-56, cooperative research associations were set up by the cotton textile industry at Ahmedabad, Coimbatore and Bombay, and by the man-made fibre industry in Bombay. The woollen textile industry set up its research association only in 1963, whereas the jute industry changed the structure of its research organization (Indian Jute Mills Association's Research Institute, to a cooperative one and renamed it "Indian Jute Industries Research Association" in 1966. During the last 10 years, other industries have also set up cooperative research associations. Thus, the Indian Plywood Research Association was established in 1961, the Tea Research Association in 1964, and Cement Research Association in 1966. The paint industry and the rubber industry have also registered their respective cooperative research associations several years back but have not yet set up their own laboratories.

According to latest available figures, the cooperative research associations employ a total staff of about 1,400 including 630 scientific and technical personnel and spend annually Rs. 7.389 lakhs and Rs. 60.924 lakhs towards their capital and recurring expenditures respectively. It can thus be seen that cooperative research occupies an important position in industrial research in the country.

ORGANIZATIONAL STRUCTURE OF COOPERATIVE RESEARCH

In cooperative research, several units of an industry jointly take the initiative to establish common research facilities for their collective benefit. Industry thus not only takes the initiative for setting up a research function, but also takes the responsibility of raising necessary capital funds to establish it and to assure that the requisite annual expenses of the research organization will be met. It is usual for the Government to encourage industry in such efforts by offering to share

the capital and recurring expenditure of the cooperative research organization. Individual industrial units can, if they so choose, take advantage of the facilities of the cooperative research association by joining it as a member. Membership is thus purely voluntary and a member has the freedom to resign from the association.

Membership can be of different categories. For example, some research associations have a category of original members who are the founders of the research organization and have contributed substantial amounts of money towards the capital expenditure in setting it up. There can also be associate members who are not required to contribute towards capital expenditure and have therefore no vested interests in the assets of the research association nor have they the right of vote in policy matters. Associate members, however, contribute towards the recurring expenditure in very much the same manner as the original members and receive the same benefits of research and services.

The management of cooperative research associations, which are registered under the Societies' Act, is vested in a Governing Council consisting of elected representatives of the original members, members nominated by the Government and coopted scientist members. Representatives of Associate members may also be coopted on the governing council. The functions of the Council are to lay down important policies for the research association in matters affecting finance, research utilisation, and staff appointments, especially at senior levels. The Governing Council will usually be assisted by its sub-committees which make recommendations to the Council about policy decisions on specific questions which they would have examined in detail. In certain questions such as the quantum of membership fees and amendments to the rules and regulations of the Association, the authority is vested in the general body to which the Council would make its recommendations. Generally there is also a research advisory committee appointed by the Council with members representing management, different branches of technologies and eminent academicians. This advisory committee, assisted by specialist panels, if found necessary, reviews in detail the work of the research association generally once a year and submits its report, comments and recommendations to the Governing Council.

Though there may be differences of degree amongst research associations, considerable authority is delegated by the Council to the Director for effective day-to-day implementation of its policies. Within the broad framework of rules, the Director has wide discretion and

is held accountable by the Council for the total performance of the organization and for financial management within the limits of the sanctioned budget. Research policies and programmes are largely initiated by him in consultation with his senior colleagues and he is required to justify to the Research Advisory Committee and through it to the Council that the particular research programme followed by him is the most suitable within the limits of the Institute's resources to meet the needs of the industry. In many cooperative research associations, the Director has also considerable authority in personnel matters such as selection, appraisal, promotion and disciplinary action. In short, the general pattern of management of these research organizations is similar to that of an industry in which policies are laid down at a board level, but the authority for execution of this policy is delegated to the Chief Executive who is accountable to the Board for overall performance within the sanctioned financial limits and policies of the organization.

STRENGTH OF COOPERATIVE RESEARCH

Because of its organizational features cooperative research offers several advantages particularly if the objective of research is industrial and economic development. In the first place industry has a direct and considerable financial stake in the research organization, having contributed sizable finances for setting it up and being required to spend fairly large amounts of money annually to sustain it. Furthermore, the fact that the initiative for setting up the research organization came from industry has a tremendous psychological value, and develops a great feeling of belongingness. It is not uncommon to find management of member units proudly bringing visitors to the research laboratory and referring to it as "ours". This direct financial involvement and feeling of belongingness help considerably to promote greater interest by industry in the research organization. In fact, if research has over a period of years succeeded in winning the confidence of the member industry, it is not unusual for a large number of members to seek advice, guidance and consultation from the research organization in numerous, diverse problems of production and management.

It will be apparent from the detailed description of policy making procedures of cooperative research organizations that industry plays a major role in moulding the shape of the research organization and in determining the nature of its work programme. There is thus a greater likelihood that the research and other activities of such a cooperative organization would meet the present and future needs of the industry more realistically than in other forms of research organization.

An important feature of cooperative research is its continued dependance on industry for financial support. Expenditure of any organization will tend to increase progressively from year to year because of increasing seniority of staff and therefore higher salaries. This increase in expenditure can be very steep if there is a spiralling inflation in the country as we have had in India in the last few years. Under these circumstances, a cooperative research organization will need financial support from industry at steadily increasing levels. It will be able to get this only if it has justified itself to its member industry and won its confidence. A cooperative research organization can meet increasing expenditure by raising the level of membership fees, increasing the number of members, from sponsored research, and lastly through royalties on utilization by industry of those processes developed by it. Each of these demands that the research of such a cooperative organization must have a high industrial utilization value. There is thus, by the very nature of its structure, an automatic provision that a cooperative research organization's work must be industry-oriented and that it must successfully establish a high level of interaction between research and industry. If it fails to do this, it will be unable to grow or even to meet its current expenses.

Another strength of the cooperative form of research organization, especially when the tradition of research is new to industry and government, is that the management policies and accountability procedures are modelled more on methods which prevail in industry rather than in Government. In a creative activity such as research, rigid application of rules and procedures is often not desirable in the best interests of the organization. This requires that the Director as the Chief Executive of the research organization must have sufficient discretionary authority delegated to him to be able to deviate from rules if he considers this necessary in the interests of the organization. The concepts and methods of management generally followed in cooperative research organizations do accept the necessity of the delegation of such authority to the Director. This, however, does not mean a lack of accountability. As would have been seen from the preceding pages, there is a very rigorous accounting both with respect to total performance of the organization as well as with respect to the total expenditure remaining within sanctioned budget limits.

In many cooperative research organizations personnel management is also largely an internal function not requiring external sanctions from various committees. Except at the senior-most levels of appointment, various decisions concerning personnel such as selection, promotion, etc.,

are taken internally by the Director with the help of his senior colleagues. Control at the Council level is generally two-fold, *viz.*, the budget limits for staff salaries and sanction of total number of vacancies in various grades. Appointments or promotions at very senior levels are made by the Committee of Council on the recommendation of the Director.

This large responsibility and authority given by the Council to the Director requires, in turn, well thought out, objective and impartial methods for selection, appraisal, promotion, etc. If exercised properly, this personnel policy would automatically involve the setting up of sound personnel practices and of quick and proper recognition of merit. One would expect that such a system would help in developing and maintaining a high degree of morale and dedication amongst the personnel which are particularly important in a research organization.

WEAKNESSES AND LIMITATIONS OF COOPERATIVE RESEARCH

To a large extent, the very factors that lead to the strength of cooperative research associations, can, under altered circumstances, also be a source of weakness and limitations.

It has been seen earlier that these organizations depend on voluntary industrial membership for financial support. This means that their continuation and growth will depend not only on the quality of their work output but also on the fortunes of the industry concerned. In times of rapidly rising costs accompanied by industrial recession, as witnessed in India in the last few years, there is a distinct likelihood that there will be squeeze on the profits of industry. This will reduce their willingness, if not their ability, to pay more for research. But these are also the times when the expenditure of research organizations too will increase steeply because rising costs lead to higher dearness and other allowances to personnel and higher costs of materials and services.

This situation may exist even if research and development is an internal function of the particular industrial unit. In a cooperative structure, however, the situation is aggravated by two further factors. Firstly, the membership and other charges which are paid by industry are on a unit basis, usually on physical installed capacity. The ability to pay more for research is thus governed by the ability of the financially weakest member of the research association. In times of rising costs and lower profitability, there would be a significant section of the industry which, instead of making profits, runs at a loss. Increasing membership or other charges to meet rising expenditure is thus

significantly limited by the capacity of the weakest members to pay more for research. The voluntary nature of membership may nullify, through resignation of several such members, any positive advantages of increased membership charges.

Another problem faced by cooperative research associations in increasing industry's contribution is the difficulty of establishing conclusive evidence about the financial benefits obtained by the industry from cooperative research. Much of the work of industrial research laboratories deals with improvements in existing technology to reduce costs, increase production and improve quality. Even approximate estimates of the resultant financial benefits to industry from adoption of such research findings are difficult to obtain partly because of industry's reluctance to supply relevant data but largely because with widely fluctuating prices and frequent changes in raw materials used and products manufactured, such financial benefits can only be shown as potential through controlled experiments but cannot be tangibly shown in the balance sheets. In these circumstances, any attempt to increase membership contributions, especially when industry itself is facing a difficult time, is likely to be met by the question "What benefit have we had from the research association?".

Any research laboratory will need continuous capital expenditure to maintain its equipment and machinery in a modern condition and to provide up to-date research facilities. Provision of such expenditure is possible only if periodic additions are made to the original capital fund of the association or if there is a surplus in the annual income expenditure position which could be used for capital expenditure. However, in a situation such as described above, it is far more likely that expenditure will exceed income and the deficit will have to be met from the capital and other reserves. If this position continues for a few years, it can do lasting damage to the competitiveness and effectiveness of the research organization in two distinct though related ways. Firstly, absence of modern research facilities would result in the inability of the organization to conduct research in certain fields or to carry it out in the most effective and economic manner. The second and perhaps the more important damage is the inability to attract and retain the best scientific talent available in the country due to want of modern research facilities. One of the major factors which attract outstanding scientists to an organization is the nature of equipment facilities that are available.

It seems necessary that some adjustment to the principle of the government contributing its share based on industry's contribution is

necessary to minimize the ill-effects of widely varying profitability of the industry on the fulfilment of the essential requirements of research. One method can be that in times of industrial recession or crisis, the Government may advance more than its share as a loan to be recovered from industry when its position improves.

The work programme and policies of a cooperative research association depend largely on the decisions of its governing council. As mentioned earlier, these councils consist of elected industry representatives, nominated government representatives and coopted scientists. It is the usual experience that of these various members, industry's representatives are the most active and regular in attendance. Thus, the shape of the research organization will be moulded largely by the thinking of industry through its elected representatives even though an attempt has been made to provide a balanced perspective between current and long term industrial needs by having non-industrial and scientist members on the council. There is a definite danger in this situation that industry may use the research association for immediate and very short term needs, unless its elected representatives are sufficiently enlightened and research-conscious. There is thus a possibility that routine activities such as quality control, testing and *ad hoc* technical services which are rightfully internal functions of industry might become the predominant functions of the research association.

In discussing the organizational structure of cooperative research associations, we saw that policy making is entrusted to various committees. This is very natural since the research association is set up to look after the interests of a large number of members who have therefore to be represented in the policy making process. At the same time, it is necessary to remember that organizations are run effectively by individuals and not by committees. This implies that the committees' jurisdiction should be at the policy making level, whereas the implementation of these policies and the day-to-day management of the organization must be left to an individual, *viz.*, the Director of the Laboratory. Excessive interference by Committees in the day-to-day functions of the Director or absence of delegated authority to him to make, within the policy framework laid down by the Committee, minor adjustments to suit individual situations would only result in delays and procrastinations and would therefore be harmful not only to the research organization but also to the member industry. It is also necessary to bear in mind that while the various members of policy making committees may have a better knowledge of industry's problems and needs, it is the Director and his senior colleagues who would have detailed knowledge about the problems

of the research organization, its present and furture needs and the possible implications to it of various policies that might be enunciated by its committees. Thus, the effectiveness with which such research associations will work would depend to a great extent on the relationship between the Council, its Chairman and the Director and on the mutual confidence and respect which exist between them. The Chairman has a dual role of being not only the head of the policy making body but also of being the immediate supervisor of the Director, who is accountable and responsible to the former. Thus, the relationship between the Chairman and the Director of the Research Association must be such as to ensure the latter of a continued understanding and support.

While too much interference by committee members in day-do-day administration is harmful, their inadequate interest in the working of the organization and its future is also undesirable. Any programme of modernization of the laboratory or addition of new functions and facilities would involve substantial expenditure for which money will have to be obtained from the industry. The Director's task in obtaining this will be eased considerably if he has active and vigorous support of the governing council, in applying the experience and mature widsom of its members for a critical examination of such plans as well as for getting them accepted and adopted by the industry.

With membership structure, it is unavoidable that there will be a wide disparity in the levels of technical and managerial sophistication amongst individual industry members and therefore in the nature of services needed by them from the research association. Since the objective of the research association is service for its entire member industry, it is faced with quite a difficult problem of evolving a suitable mix in its research and other activities to satisfy on the one hand requests for services of an unsophisticated nature and on the other, to maintain adequate research competence to satisfy the needs of the most sophisticated and advanced industrial member. Relative weightages to be given to programmes of general interest to membership and to those of interest to only a limited number of members becomes yet another complicated problem. In a developing country like India, it is not uncommon to find that for a large number of units in an industry, systematic application of existing knowledge with relatively minor improvements and innovations is the most urgent need for improving technical efficiency and reducing production costs. With the structure and nature of research associations, it will therefore be inescapable that much of its work must be geared to such needs. This, however, has to be accomplished without lowering the research competence

of the organization or without its degenerating to become a mere problem solving body, since in such an event the lack of stimulation would mean loss of the brightest scientists and technologists and therefore of a deterioration not only in its level of research but even in its ability to help industry in problem solving. It would perhaps be recognized that there is a danger in this situation of a continuous pressure from industry to increase efforts on applied research and work of a technological adaptation nature at the cost of long term applied or basic research. Unless the organization has clear-cut policies and unless the Director can resist such pressures, the long-term research capability of the organization and therefore its value to the industry will suffer.

An important method by which research organizations help industry is by providing facilities for undertaking research work under sponsorship from individual industrial units. The cooperative structure imposes a limitation in this respect. By its very nature, the accumulated experience and know-how of its scientific and technical personnel must be available to all its members. Yet sponsorship requires that the results of such research should be available exclusively to the sponsoring member. While it would be possible to give exclusive rights of the results of such research to the sponsor, atleast for a limited period, it is impossible to guarantee that the insights and skills developed by the scientists through the sponsored research programme will not and cannot be utilized for other members of the Association.

Lastly, the very close contacts between the research organization and industry, while beneficial from the point of view of research utilization, poses also a serious problem, *viz.*, attraction of senior and experienced staff from the research laboratories to industry. To an extent this by itself is not undesirable. In fact, this is one important though intangible service a research organization can give to industry. However, if frequent turnover takes place at very senior and key positions or when a new function is just getting established, it can seriously handicap the workplans of the research organization to the detriment of the total industrial membership. Being linked up with the Government because of receipt of grants-in-aid, these research associations are required to follow a salary structure adopted in the government research laboratories. However, the conditions of work in terms of contacts with industry, nature and pressures of work, benefits, etc., are significantly different between the two types of research organizations. Suitable modifications in existing salary policies and structures need to be evolved to ensure reasonable staff stability and continuity especially at senior levels.

INDUSTRIAL RESEARCH UTILIZATION THE PROBLEMS OF TECHNOLOGICAL TRANSFER AND IMPORT OF TECHNOLOGY

G. P. Kane

IN the last few years, rapid reduction of foreign exchange expenditure has been an important national objective. The substantial expansion of production, recorded in the same period, was an outcome of the efforts made in the country to increase the local availability of many products which used to be imported before. However, the cherished goal of achieving a balance between the annual value of imports and exports is still quite distant. This situation is a result of the massive imports of machinery that were necessary for establishing units of industrial production as well as the increasing value of imports of essential raw materials, such as, non-ferrous metals, sulphur and phosphate rock needed to maintain the units in continuous operation. Consequently the drive for saving foreign exchange has extended to other fields. Recent proposals for restricting the use of imported technology as well as for reduction in payments for imported technical know-how, represent steps in the new drive.

The proposals take many forms. According to one suggestion when more than one industrial unit is to be established for the production of an article on the basis of overseas know-how, it would be appropriate for a central technical organization to purchase the know-how and distribute it to all the units without further drain of foreign exchange. A more stringent view states that once a unit is established in the country with overseas know-how, further units for making the same product should be asked to obtain technical know-how as well as engineering services from the first unit. Sometimes it is argued that a developing country really does not need the most modern and sophisticated technology available in the world and that scientists now available in India in large numbers can be depended on to develop all technical know-how needed in the country if they are given a chance. Simultaneously there is a lament that our dependence on imported technical know-how is a direct result of the fact that the proportion of national income spent on research is disappointingly small in comparison with that in advanced countries. These views are expressed with a conviction

that seems to suggest that those who do not subscribe to them are anti-national in their outlook. Adoption of these views is likely to have so profound an influence on the further growth of industrial activity in the country in the most crucial period that their emergence as a basic concept for modification of the industrial policy of the country deserves serious examination.

In advanced countries in the West, the motivation for technological development was provided by the material advantages that were obtainable from the discovery of a new product, or by the introduction of an improved process or machine that helped to reduce the effort necessary to accomplish a given task as well as the cost. In addition, when the new product helped to reduce human suffering, the scientist responsible for the innovation received honours and respect in addition to monetary rewards. Sometimes the inventor himself had the acumen to commercialize his work; more often the exploitation of a discovery was accomplished by a company with large resources, after compensating the persons responsible for the discovery. Gradually, companies themselves initiated research projects involving heavy expenditure and the State supplemented such efforts where the projects were concerned with national security or desirable social advance. Industries flourished in a competitive world where the guidelines were novelty and efficiency, and no organization could survive on borrowed knowledge alone. Therefore, although technical know-how was purchased by a company even from its competitors, it was accepted that for a stable existence each company must maintain a leading position in some fields and that this could not be achieved without involvement in research. The race for survival as well as leadership has enriched the world in the last thirty years with innovations that have transformed the basic concepts in many fields of human endeavour. The most prominent among such innovations are, antibiotics and synthetic drugs for the treatment of diseases; jet propulsion for air transport anb space travel; nuclear energy for power production; electronics with its ramifications including computers; cracking and oxidation of petroleum fractions for low cost production of materials including synthetic polymers such as plastics, fibres and rubber, as well as ammonia; and conservation of food through pest control and newer techniques of preservation. Most of them were unknown twenty-five years ago. Yet their applications have spread in all advanced countries so rapidly, that industries connected with them have been responsible for the creation of employment opportunities for millions of persons and production of immense value.

II

The incentive for industrial growth has been different in India.

A tradition of trade in which the East India Company thrived three centuries earlier continues to influence production activity. Agricultural commodities and naturally occurring minerals were the main items of trade until enterprising individuals, aliens as well as Indians, set up agro-industries such as cotton textiles, jute manufacturers, tea and sugar. Other industries that recorded significant production before the second world war were iron and steel and cement, both dependent on mineral raw materials. Manufactured products like chemicals and machinery were mainly imported until the trade was restricted severely in the second world war. In the scarcities of the war period readily available products fetched prices several times the normal. These circumstances encouraged many traders to become manufacturers of products which they know they could sell. But the activities were carried out with the minimum expenditure on plant and equipment as recovery of the investment before restoration of normal trade was an important objective. For the same reason, it was necessary to commence production without any delay. The use of readily available technical know-how was therefore of crucial importance. The gap between the level of industrial activity in India and abroad was so great during the years following the war, that the use of imported technology and equipment provided a shortcut for success in organizing production, and involvement in research for developing new products was quite unnecessary.

The significant difference in the outlook of industry that existed between advanced western countries and India was not without its influence on industrial activity in India during the post-Independence years. In their enthusiasm for achieving the national objective of creating more wealth as well as work in the country through industrialization, the country's planners were compelled to regulate the expenditure of available slender resources in specific fields and to attempt to match production in each with the anticipated demands. As the balance of payments position deteriorated, application of the regulatory provisions of the Industries Act and of import control increased in severity. A seller's market with high profit margins, therefore, prevailed in respect of most manufactured goods for many years. In this situation industrial activity was assured of high profits, if the schemes for production could be implemented early and the products replaced imported articles for which a demand was known to exist in the country. Collaboration with a well known overseas manufacturing company whose products sold under a popular brand name, provided an additional guarantee of profits. Thus, by inclination as well as through circumstances, throughout the period of the Second and the Third Five Year Plans, there was an incentive for the entrepreneur

in India to seek overseas technical collaboration for making products that were well known and in demand and the need to develop new products by research did not exist. Non-appreciation of this background accounts for the criticism usually heard in the country that the Indian industrialist is not interested in research carried out in the country.

In the years immediately after Independence payments for overseas collaboration were made in several ways. There were Patent fees, royalties on production, payments for transfer of technical know-how and for engineering services, commission for equipment purchased abroad, contributions towards expenditure on research overseas by the collaborator, and sometimes payments for the use of brand names for products. Dividends on shares in the equity capital of an Indian company held by the collaborator, either as payment for technical know-how or by purchase for cash, constituted an additional outflow of foreign exchange. There were some instances where payments in all forms mentioned above were applicable to a collaboration agreement. The entrepreneur in India did not seem seriously averse to these payments as they conformed to the pattern accepted by industry in the Western countries and because the charges would be covered by the price charged to the consumer. The bargaining position was also weak, as the Indian entrepreneur did not have know-how to offer in return. But the payments jarred on the sentiments of a sensitive population that had obtained its freedom from colonial rule only recently. A feeling of colour prejudice and political bias was generated with the practice adopted by many international companies to establish one hundred per cent owned Indian subsidiaries for making highly profitable, sophisticated products, as well as their hesitation in appointing highly qualified Indian technical officers to positions of responsibility. The feeling was enhanced when there was no response to repeated attempts to obtain technical collaboration for products such as photographic films and optical glass from any company abroad. In spite of the resentment at these developments it was not possible to avoid altogether the import of technical know-how, because the desire for industrial expansion was urgent. However, Government attempted to assuage the feelings of the public by restricting constantly the scope of payments for know-how. Subsequent abolition of all payments for use of brand names, refusal to approve separate payments for technical know-how and research contribution, reduction in the rates and duration of royalty payments, as well as the acquisition of a share in equity capital in lieu of payments for know-how and compulsion to increase progressively the proportion of shares held by Indian nationals, represent some of the steps taken by Government in this direction.

Occasionally technical know-how as well as financial support were available on non-commercial terms from international organizations devoted to the amelioration of human suffering like WHO and UNICEF. The first Penicyllin unit of Hindusthan Antibiotics and the DDT units of Hindusthan Insecticides were established on this basis. But a really alternative source of know-how appeared on the scene after the exchange of friendly visits in 1955 between the two leaders from the U.S.S.R., Bulganin and Khruschev, and Prime Minister Nehru. The offer of the Soviet Union of assistance in the establishment of industrial enterprises in India, without payment for technical know-how and readiness to accept payment for machinery by purchase of goods available in India for export, created a most favourable impression. In the pervading enthusiasm it was overlooked that in this new form of collaboration the number of experts for whom payment had to be made was exceptionally large and that there was no element of competitive prices in the purchase of equipment from a monopoly state enterprise in the U.S.S.R. The Bhilai Steel Works, the Heavy Machinery Plant at Ranchi and the antibiotics, synthetic drugs and surgical instruments units of the Indian Drugs & Pharmaceuticals were established on the basis of cooperation offered by the U.S.S.R. This scheme for technical collaboration was repeated later on in arrangements made with other socialist countries in Eastern Europe. These countries offer technical know-how that they have developed themselves; at least in some cases it does not represent the latest or most efficient and economical processes. The Committee on Public Undertakings has expressed its concern on this aspect in its recent report after examination of the working of the Indian Drugs and Pharmaceuticals. It is also known that although initially the socialist countries attempted to develop all technical know-how afresh, latterly they have shown a readiness to buy sophisticated and superior know-how from Western countries at a high price. There is no doubt, however, that the advent of an alternative source of know-how did provide a useful bargaining counter during discussions for purchase of know-how in general.

Industry has flourished so well under the protective umbrella of controls in the last two decades that it seems to consider that shortfall between demand and supply is essential for progressive industrialization. In its effort to maintain this position future needs of various products are underestimated and the corresponding capacities for production are overestimated. Industry has adopted as its slogans different concepts like import substitution, export promotion and saving of foreign exchange, depending upon whichever is popular with Government at a given time. It is common practice for companies to argue that expansion of the capacity of existing units should be preferred by

Government instead of the issue of licences for setting up new units, because expansions require lower expenditure of foreign exchange per unit of production. The underlying objective may be, and very often is, the desire to avoid the creation of competition rather than a saving of foreign exchange. A new variant of this argument is that instead of permitting newly licenced units to purchase technical know-how from abroad, they should be asked to obtain the same from existing units in the country that make the same products. The desirability of avoiding repetitive overseas payments for know-how for the same product is stressed by some scientists also. They feel that such a restriction would not only avoid expenditure of foreign exchange but also provide opportunities for technical talent available in the country to contribute towards industrial development. It seems to be overlooked that acceptance of this suggestion as a policy would be tantamount to the creation of a monopoly of technology by a decision of Government under the control of an industrial group which itself purchased the know-how from abroad and which cannot be depended on for fairness to its competitor over whom the group will have virtual control. It is unfortunate that this retrograde view appears to be gaining in favour in spite of strictures against monopolies by the Monopolies Commission and the Licencing Inquiry Committee.

III

The convergence of views of industrialists and some scientists appears strange in view of the bitter criticism made by the same scientists that Indian industrialists are not interested in the research work of scientists in India. Perhaps it is a result of the peculiar circumstances under which research activity has grown in the country since Independence. Whenever research was undertaken directly under the auspices of a Department of Government concerned with the execution of a policy for production, such as agriculture, minerals and more recently, atomic energy, there was a specific goal and the working scientists had a feeling of involvement in nationally desired activity. Such satisfaction was not available to scientists engaged in the chain of National Laboratories established one after another soon after Independence. The Laboratories were set up with the avowed purpose of fighting hunger and poverty by work on the utilization of natural resources available in the country for industrial production. However, these Laboratories have been administered by the Ministry of Education and not by any of the Ministries dealing with private and public sector industries. The creation of Laboratories for industrial research directly under the auspices of Government instead of by the industries themselves and pursuit of research with funds drawn from Government

through a Ministry unconnected with industries has divorced their scientists from close contact with the needs of industry. The scales of salaries for scientists as well as the facilities for research in the National Laboratories were much better than those available in the Universities. But they were not adequate for attracting men with experience of industry. Inevitably, the staff of the Laboratories consists of scientists predominantly drawn from the Universities, whose awareness of the vital factors of cost and time in industry, as well as experience of scaling up processes for adoption in industry is far from adequate.

Selection of problems for investigation in the National Laboratories was not easy. There is no Government agency that can hand down problems of agreed national priority and support the investigations with funds through all stages of development. Industrialists and independent experts are appointed as members of Executive Councils of the Laboratories in the hope that they would suggest problems of value to industry. But it is common experience that such members prefer to restrict their comments to proposals made by the staff of the Laboratory. Perhaps this was to be expected as usually an industrialist would prefer to investigate problems connected with his own undertaking in a Laboratory working under his own control.

In this atmoshpere it is not surprising that research programmes undertaken by the Laboratories on the basis of suggestions from its own scientists have not proved attractive to either the private or the public sector industries. These programmes seem to ignore the fact that there is immense scope for investment for making products that have been developed elsewhere, and for which technical know-how is available readily at relatively low cost. So long as this situation continues it is unlikely that in a developing country like India the entrepreneur would be interested in pursuing the time-consuming and costly procedure of rediscovery of known processes and their redevelopment in the country. The lukewarm attitude of industry to the research investigations has been a severe disappointment to the scientists in the Laboratories. But it is unfortunate that the experience did not induce the scientists towards an objective reappraisal of their own approach to applied research. Instead, they embarked on a far more expensive programme of setting up Pilot Plants in their quest to attract the attention of industry. It seems, however, that the term Pilot Plants is not understood very well. Normally a Plant Pilot is set up when a new product or process shows promise in Laboratory investigations, but it is considered that before scaling up for commercial production it is necessary to determine data on an intermediate scale operation in critical areas. As Pilot Plants are expensive to install and to operate it

is customary to identify the agency that will adopt the process for commercial production if it proves attractive and to ensure that the agency participates substantially in the expenditure. Recent examination of Pilot Plants set up in the National Laboratories has revealed that these considerations have been applied only rarely.

The term Pilot Plants seems to have different meanings to different people. Some consider that it is an experimental plant built to demonstrate the ability of Indian scientists to develop technical know-how. Some others consider it quite reasonable to import expensive semi-commercial units and set them up as Pilot Plants for demonstrating the suitability of well known commercial processes for using raw materials in India, to persuade Indian entrepreneurs or Government to adopt the processes. There have been instances of Pilot Plants proposed and approved at public expense for developing processes operating on a commercial scale even in India. Criticism or recommendations for disposal of such Pilot Plants by duly constituted official committees have been sought to be represented as administrative interference in the freedom of scientists. It is important to note that since the CSIR introduced a separate head of expenditure for Pilot Plants in 1956 nearly ten crores of rupees have been spent for the purpose. A 1966 CSIR publication "Data on Utilization of Research" lists 155 Pilot Plants/Projects, some of which have been in existence for ten years or more. As information is not given whether they were financed by a potential user company, or whether these plants have led to the establishment of commercial production units, it might be presumed that they were set up at public expense and that so far they have not benefited national economy.

Instead of reorienting their research work after pondering over the unfortunate results, the frustrated scientists express views that, if adopted, would prove disastrous to the country. For example, it is claimed by them that the country is not progressing rapidly in its industrialization programme because the percentage of gross national product spent on research is abnormally low. It can be proved that expenditure on research and the standard of living in a country are not necessarily related. More important, the amount available for research is dependent not only on the percentage of national product spent on research but more on its value. Thus at 3.4 per cent in the U.S.A., and 0.3 per cent for India, the annual amounts available on the basis of annual national incomes of 658 and 38 billion dollars would be 22,372 and 114 million dollars respectively. Even a ten-fold increase in the latter figure would leave us far behind the American effort. Besides, a far greater actual achievement by scientists that is available at present in the country would be necessary before planners can be persuaded to set aside so big a slice of the available resources for scientific research.

Another suggestion, as mentioned earlier is that the rigorous restrictions applicable today to the imports of raw materials as well as machinery should be extended to the import of technical know-how, as thereby foreign exchange will be saved and also Indian scientists will be given a chance to develop all technical know-how in the country. Similar attempts to develop the economy of a country in isolation from the rest of the world have been tried earlier by Japan and the U.S.S.R. and later given up as unprofitable. Both these countries now purchase sophisticated technology from the best available sources and pay as well as receive consideration for technical know-how. Except for the United States of America, no other country has a positive balance of payments for know-how. In the field of chemicals and electronics, in particular, advances in technology take place so rapidly that it is not unusual for a new process to become obsolete and uneconomical in a few years. To give one example, the Indian paper industry employs essentially the low yield and high cost, full chemical, batch process for producing pulp, while recently the world over, the use of disc refines and continuous pulping has become popular as thereby the yield is increased and the cost is reduced. To avoid adoption of the newer techniques, because it would involve further payments for technical know-how or some imported equipment, would not be in our national interest. The proposal to compel the use of technology from a single source for setting up more than one plant for the same product to reduce payments for technical know-how is also not attractive. It is possible to obtain even greater economy in the cost of plant as well as on royalties if instead of four smaller plants a single plant of large capacity is set up.

The resentment expressed in public by a few scientists at their isolation from industrial growth might create the impression that Indian industry is unmindful of the benefits that accrue from research. This is far from correct. Even though the industry has been established so far primarily on imported technology, considerable adaptation was necessary to ensure success in operation while using local raw materials of different specifications. Increasingly such adaptation work is being done in the country in laboratories and research departments established by the industries themselves. These efforts are growing in volume with the progressive restrictions on imports. Greater tax concessions offered recently for expenditure incurred on research have also served as an incentive. Research Laboratories have been established by several manufacturing companies for work on their immediate problems as well as for the development of new products with investments of several million rupees each in different fields such as dyestuffs, drugs, rayon, basic and fine chemicals and cement. Their work has led to commercial production of rayon grade pulp from bamboo, reactive dyes,

special varieties of cement and the use of by-product gypsum for production of ammonium sulphate. All innovation work done by such laboratories is not published because most of it is intended for the benefit of the sponsors. It must be conceded that the volume of such research work is not comparable with that done by manufacturing companies abroad; however, this is equally true about the relative industrial activity.

IV

From the above analysis it would appear that the immediate problem is not that of utilization of research but to induce the Laboratories to undertake research that can be utilized. This can be done if the views expressed by the Third Reviewing Committee of the CSIR in regard to the relation between World Science and Indian Research are adopted for guidance. The Report of the Committee (page 26) published in 1964 states:

> "As the outlay that the country can afford may not compare with scientifically and technologically advanced countries for a long time to come, the planning of research must be such as to ensure maximum return on investment in term of practical results achieved. India has the advantage here in that she can draw upon the world's accumulated and growing scientific and technical knowledge, experience and information. It will be wasteful to redo what has already been done elsewhere. For quick results Indian Science and Technology must catch up at an advanced stage and go on from there."

It is understood that while discussing Fourth Plan proposals of the CSIR the Planning Commission have come to the following conclusion: "Whenever industry has already taken up commercial production for certain items, pilot plant work for the same should not be taken up in a National Laboratory unless some further development work is necessary at the instance of industry."

These weighty statements do not support the views sometimes expressed by individual scientists urging a ban on the import of technology and advocating that scientists in the country should be given an opportunity to develop afresh known processes for saving foreign exchange. There are many problems of vital importance to the country awaiting solution. Among these may be mentioned inexpensive methods for conversion of brackish into fresh water in many areas in the country; an increase in the supply of protein and other nutritive foods

by development of synthetic processes and by improvement in agronomic practices; development of synthetic fibres with properties similar to those of cotton; production at low cost of newer drugs and medicines to ensure good health as well as efficient products for successful family planning programmes; and prevention of waste of materials and energy.

Reorientation of research programmes in this manner would require first of all the acceptance of accountability to the country by scientists for expenses incurred on research. The scientist can claim freedom for pursuit of his investigation, but not the freedom of choice of problems as well, particularly when pursuit of these problems involves substantial expenditure from public funds. It is essential that before undertaking expensive and/or long term research programmes, the proposals are examined by an independent group that includes representatives of organizations that are interested in the programmes and who are prepared to confirm their interest with substantial financial support. Laboratories essentially dependent for their funds from Government should be administratively associated with a Ministry of Department concerned with the relevant industrial activity. There need be no conflict between basic and applied research so long as the areas chosen for the former are complementary to the latter. There is no merit in continuing research work on problems indefinitely. Periodically the work should be reviewed and investigations that have remained infructuous for many years should be wound up. Our slender resources ought to be used in a few chosen fields of investigation for which the conditions in India appear favourable. Concentration of effort in this manner would help us to develop technical know-how at the world level for some products and to receive payments for such know-how from abroad.

With the impressive growth of industry in the last fifteen years, India is on the threshold of massive exports of manufactured products. Such exports can be achieved only if our products are comparable in quality and price with those obtainable elsewhere. There is a growing opinion in the country that this can be achieved only if an element of competition is introduced in our economy with relaxation of controls. It would be strange indeed if this very period is chosen for imposing restrictions that would prevent our industry from obtaining the best available know-how from any source.

ORGANIZATION, MANAGEMENT AND PROGRESS OF AGRICULTURAL RESEARCH IN INDIA

B. P. Pal

Organization and Management of Agricultural Research

IT was in the beginning of this century that the Government of India recognized the need for the establishment of a sound system of scientific investigations in connection with agriculture. In 1905, Government laid the foundation of organized research in India by establishing the Agricultural Research Station and the Experimental Farm (later called the Imperial Institute of Agricultural Research, and still later, after Independence, the Indian Agricultural Research Institute) at Pusa (Bihar) with the help of a donation of £30,000 made by an American philanthropist, Mr. Henry Phipps of Chicago. Subsequently, funds were provided for the development of agricultural research and education in the Provinces and a separate Department of Agriculture was constituted in most of the Provinces. Agricultural Colleges were also founded in Poona, Kanpur, Nagpur, Lyallpur, Coimbatore and Sabour. Earlier, a Central Institute for Veterinary Research was established in Poona in 1889.

The administration and coordination of agricultural work and governmental policy were looked after by the Government of India till 1921. The constitutional changes of 1919 resulted in the transfer of the subject of agricultural research, education and development to the erstwhile Provinces and the Government of India divested itself, except for limited objectives, of all powers of direction and control of agriculture, including research, teaching and policy making. Although it was originally intended that the Central Government Institutes should function as an apex of an efficient research organization in the country, no provision was made in the Government of India Act of 1919 for the coordination of the work of these Central Institutes with that of similar institutions in the Provinces. As a result, there was no agency in the country charged with the specific purpose of coordinating work on agriculture and animal husbandry in different provinces and bringing them in line, with the policy of the Central Government. A Royal Commission on Agriculture was appointed in 1926, to examine

and report on conditions of agriculture and the rural economy of India, with particular reference to the measures being taken for the promotion of agricultural and veterinary research and education. It was as a result of the recommendation of this Commission that the Imperial (now Indian) Council of Agricultural Research was brought into being in 1929 as a Registered Society, with the primary object of promoting, guiding and coordinating agricultural research and education throughout India. The Council was also to serve as a link between agricultural institutions in India and in foreign countries. The Commission had hoped that "through the proposed Council of Agricultural Research, it would be possible to develop satisfactorily agricultural research in India, to secure a continuity of policy and to ensure a programme of ordered advance in the domain of agricultural research".

Apart from the Indian Council of Agricultural Research, a number of Central Commodity Committees dealing with research in respect of particular crops were set up as semi-autonomous bodies, financed by grants from the Government of India or by income from cesses levied under specific Acts of the Central Legislature constituting the Committees. These Committees were located in the main growing regions of the crops concerned. The Indian Central Cotton Committee was the first to be established at Bombay in 1921, followed by the Indian Lac Cess Committee at Ranchi in 1931, the Indian Central Jute Committee at Calcutta in 1936, the Indian Central Sugarcane Committee at Delhi in 1944, the Indian Central Tobacco Committee at Madras and the Indian Central Coconut Committee at Ernakulam in 1945, the Indian Central Oilseeds Committee at Hyderabad in 1947 and the Indian Central Arecanut Committee at Kozhikode (Kerala) in 1949. The last to enter the field was the Indian Central Spices and Cashewnut Committee located at Ernakulam (Kerala) in 1962. Most of the Central Commodity Committees had set up their own Research Institutes and Centres in the various parts of the country.

The Government of India had also established under their direct administrative control a number of Research Institutes such as the Central Rice Research Institute, Cuttack, the Forest Research Institute & College, Dehra Dun, the National Dairy Research Institute, Karnal, the Central Potato Research Institute, Simla, the Central Arid Zone Research Institute, Jodhpur, etc. Similarly, the State Governments also set up their own Research Institutes and Experimental Research Farms.

Under our Federal Constitution, which came into force in January 1950, both the Centre and States must assume a share of responsibility

for ensuring progress in agricultural research. At the level of the Union Government, agricultural research is not only the responsibility of the Ministry of Food, Agriculture, Community Development and Cooperation, but there are a number of other research institutions, such as the Tea, Coffee and Rubber Boards under the Ministry of Commerce, and the Central Food Technological Research Institute, the Botanical and Zoological Surveys of India under the Ministry of Education, which are also conducting research on agriculture or connected subjects. Even in the Ministry of Food and Agriculture, there was till very recently, a multiplicity of agencies controlling and operating research without any clear-cut and rational demarcation in their functions and fields of responsibility. Although the Indian Council of Agricultural Research was, since its inception in 1929, intended to be the main agency for promoting, guiding and coordinating agricultural and animal husbandry research in the country, the Council had no sway or control over the various agencies charged with responsibility of carrying out research. The various Central Research Institutes were being directly controlled by the Ministry of Food and Agriculture and did not come within the purview of the Indian Council of Agricultural Research. Similarly, the Council had also no control over the Commodity Research Institutes run by the various Central Commodity Committees. The Council had, therefore, control only over the research schemes financed by it and the few research institutions established under its own administrative control. As a result, there was no effective mechanism or any single agency, responsible for coordinating and directing the research efforts as between the Central and State Research Institutions, the Indian Council of Agricultural Research and the Commodity Research Institutes.

Recent advances in the scientific field require the coordination and pooling of all available scientific talent, equipment and other resources, so as to ensure their most economic and optimum utilization. A research worker cannot afford to work in isolation any longer and the days are gone, as far as applied research in agriculture is concerned, when a lone researcher could hope to achieve very significant results; team work is, therefore, important as never before. In India, we are faced not only with a critical shortage of really competent scientists, but have also, at present, to import most of the costly modern equipment required for conducting research. Our national interests, therefore, demand that we should make the best possible use of our limited scientific talent, and other resources by concentrating them at a few selected places, rather than dispersing them at numerous places with a multiplicity of channels of control, resulting in their dilution and wastage.

Two Joint Indo-American Teams were appointed by the Government of India, one in 1954 and the second in 1959, to look into the problems of agricultural education, research and extension. A third Review Team was appointed in 1963 with the specific object of enquiring into the existing research set-up in India and suggesting suitable changes. The teams consisted of eminent scientists in the field of agriculture from U.S.A., U.K. and India.

These first two Teams felt that the Indian Council of Agricultural Research should be enabled to become an effective instrument for coordinating research on agriculture and animal husbandry in the country, and made certain suggestions in that behalf. The changes introduced, however, had only a marginal effect in achieving an effective coordination of research and integration of work in the different scientific disciplines. The last Team, led by Dr. Marion Parker of the U.S. Department of Agriculture, in its report submitted in 1964, therefore, suggested more fundamental alterations in the structure and scope of activities of the Indian Council of Agricultural Research. This Team wanted to achieve two main purposes. First, the research work in progress under (*a*) what have been termed as the subordinate offices of the Department of Agriculture (which included Institutes like the Indian Agricultural Research Institute, the Indian Veterinary Research Institute and the National Dairy Research Institute), (*b*) PIRRCOM centres and certain other institutes directly managed by the Indian Council of Agricultural Research, (*c*) Commodity Institutes like those on jute, arecanut, coconut, tobacco, etc., managed by separate Commodity Committees, (*d*) Agricultural Universities, and (*e*) State Governments, should all become part of an integrated set-up and should become instilled with a sense of common purpose. Secondly, the administrative and organizational structure of the Indian Council of Agricultural Research should be modified in such a way that the administrative part of the machinery becomes subservient to the scientific and technical part. In other words, Indian Council of Agricultural Research should become an effective scientific body so that it could provide the leadership necessary for stimulating major research break-throughs.

The recommendations made by the Teams were carefully examined by the Government of India. It was felt that there should be perfect coordination between the various agencies conducting agricultural research in the country and that this coordination could best be achieved by placing the various Research Institutes under the Indian Council of Agricultural Research. An autonomous organization has got more freedom of action as compared to a normal Government

Department where work is often delayed by time-consuming procedural formalities and the existence of rules and regulations not generally suited to the needs of a research organization. The Government of India, therefore, decided to reorganize and revitalise the Indian Council of Agricultural Research so as to enable it to stimulate and serve agricultural research in a better manner. The Council has, accordingly, been reorganized with effect from 1st April, 1966. The salient features of the reorganized Council are:

(*i*) The rules have been suitably revised so as to make the Indian Council of Agricultural Research a really functional, technically competent and adequately autonomous research organization.

(*ii*) The Governing Body of the Council has been reconstituted making it thereby pre-eminently a body of scientists and those with interest in or knowledge of agriculture.

(*iii*) A career scientist has been appointed as its first Director-General and Vice-President of the Council, thereby replacing the tradition that such a post is to be occupied only by an administrator.

(*iv*) The administrative and financial control of the following Research Institutes has been transferred to the reorganized Council: (1) Indian Agricultural Research Institute, New Delhi; (2) Indian Veterinary Research Institute, Izatnagar (U.P.); (3) National Dairy Research Institute, Karnal (Haryana); (4) Central Potato Research Institute, Simla (Himachal Pradesh); (5) Central Rice Research Institute, Cuttack (Orissa); (6) Central Arid Zone Research Institute, Jodhpur (Rajasthan); (7) Indian Grassland & Fodder Research Institute, Jhansi (Uttar Pradesh); (8) Central Tuber Crops Research Institute, Trivandrum (Kerala); (9) Central Sheep & Wool Research Institute, Avikanagar (Rajasthan); (10) Technological Research Laboratory (Cotton), Bombay; (11) Jute Agricultural Research Institute, Barrackpore (West Bengal); (12) Technological Research Laboratory (Jute), Calcutta; (13) Central Tobacco Research Institute, Rajahmundry (Andhra Pradesh); (14) Central Coconut Research Station, Kayangulam (Kerala); (15) Central Coconut Research Station, Kasaragod (Kerala); (16) Central Arecanut Research Station, Vittal (Mysore); (17) Indian Lac Research Institute, Ranchi (Bihar); (18) Central Inland Fisheries Research Institute, Barrackpore (West Bengal); (19) Central Marine Fisheries Research Institute, Mandapam Camp (Tamil Nadu);

(20) Central Institute of Fisheries Technology, Ernakulam (Kerala); (21) Sugarcane Breeding Institute, Coimbatore (Tamil Nadu); (22) Indian Institute of Sugarcane Research, Lucknow (Uttar Pradesh); and (23) Institute of Agricultural Research Statistics, New Delhi.

Similarly, 8 Soil Conservation, Research, Demonstration and Training Centres have also been placed under the Council. In addition, the Council has set up the following Research Institutes: (1) Institute of Horticultural Research, Bangalore (Mysore); and (2) Central Soil Salinity Research Institute, Hissar (Haryana).

(*v*) In view of the deficiencies of making recruitment to scientific and technical posts through the Union Public Service Commission, recruitment to such posts under the Council is now being made on the recommendations of Selection Committees consisting of outstanding scientists in the particular disciplines, constituted by the Council itself.

(*vi*) While the Council is the decision-making and executive authority for planning, developing and coordinating research policy and programmes, actual research work is being undertaken through its Research Institutes and Stations. The Directors of the Research Institutes have, accordingly, been delegated adequate administrative and financial powers, so as to enable them to function in an atmosphere of comparative freedom with the requisite amount of flexibility, elasticity and autonomy.

(*vii*) The reorganized Council has also developed a series of problem and production-oriented research projects on an all-India basis which are being implemented with the active cooperation of the Agricultural Universities and State Governments. These projects are proving to be highly effective not only in making research activity more efficient, expeditious and productive but also in the development of valuable research potential in the country.

(*viii*) The Indian Council of Agricultural Research is also responsible for coordinating and fostering agricultural education and plays more or less the same role in this field as the University Grants Commission does in the field of basic sciences and humanities education. It provides assistance to Agricultural Universities and Colleges for their development programmes, for improving the quality and standards of teaching, for purchase of books and equipment, expansion

of library facilities, construction of hostels, etc. Financial assistance amounting to Rs. 2.5 crores was given to the Agricultural Universities in the country during the year 1968-69.

The Minister for Agriculture in the Government of India is the President of the Council. The Director-General of the Council who is *ex-officio* Additional Secretary to Government, is its Principal Executive Officer and Vice-President. He is the principal adviser to the Central Government on all matters connected with agricultural and animal husbandry research and education, referred to him.

In developing research programmes and evaluating research proposals submitted to it, the Council functions through:

(*a*) a *Governing Body* which is the supreme decision-making and executive authority. Presided over by the President of the Council, it is pre-eminently a body of scientists and those with interest in or knowledge of agriculture. It decides research policy, approves all research programmes and projects and also controls the funds of the Council. The budget of the Council is finally sanctioned by the Government of India;

(*b*) a *Standing Finance Committee*, which examines the annual budget of the Council and submits it to the Governing Body with its recommendations. It also scrutinizes the estimates for all research proposals;

(*c*) an *Advisory Board*, which considers proposals and make recommendations regarding the lines on which research and education in agriculture, animal husbandry, forestry and fisheries and allied subjects should be conducted and the channels into which these should be guided;

(*d*) four *Standing Committees*, each for Agricultural Research, Animal Sciences Research, Agricultural Education, and Agricultural Economics, Statistics & Marketing, which initiate, examine, guide, review and coordinate research and educational activities in their respective spheres and assist and advise the Governing Body in respect of these matters; and

(*e*) *Scientific Panels*, which review research projects and make recommendations to the respective Standing Committees. The Panels are concerned with specific disciplines, etc., plant breeding, plant pathology, entomology, horticulture, animal breeding, fisheries research, dairy science, etc.

The Director-General is the Chairman of the Advisory Board and the four Standing Committees.

On the technical side, the Director-General is assisted by four Deputy Directors General, one each in the field of (*a*) Crop Sciences, (*b*) Soil, Agronomy, Irrigation & Agricultural Engineering, (*c*) Animal Sciences, and (*d*) Agricultural Education. Pending the creation of posts of Assistant Directors General, the Deputy Directors General are being assisted by the Deputy and Assistant Agricultural/Animal Husbandry Commissioners and other technical officers. Each Deputy Director General is responsible for the preparation, scrutiny, review and technical control of the research schemes and projects within his discipline/field.

On the administrative side, the Director-General is assisted by the Secretary of the Council, who is *ex-officio* Joint Secretary to Government, three Additional Secretaries, ten Under Secretaries and a Director of Budget, Audit and Accounts. The Joint Secretary in the Ministry of Finance, accredited to the Ministry of Food, Agriculture, Community Development and Cooperation is the Financial Adviser of the Council.

The Secretariat is organized into various technical sections, service sections and sections dealing with administration of the Institutes. While the Indian Agricultural Research Institute, Indian Veterinary Research Institute and National Dairy Research Institute report directly to the Director-General, in regard to the administration of the remaining Institutes, the Director-General is assisted by the respective Deputy Director-General and the Secretary.

The activities of the Council are being financed by the Government of India by (*a*) out-right grants-in-aid, and (*b*) payment of receipts of cess collected in the form of duties of excise and customs imposed on various agricultural produce.

The annual expenditure of the Council is estimated at Rs. 16.6 crores for 1969-70.

The Progress of Agricultural Research

It is difficult to summarize the progress of agricultural research in a country of the size of India where as already indicated earlier, research is conducted both by central institutes and in the States, the Agricultural Universities being an important new feature in the latter.

Also, unlike practically all advanced countries, the number of crops is very large, embracing cereals, pulses, fruits, vegetables, tubers, oil plants, fibre plants, medicinal and essential oil plants, etc. This has meant that the very moderate resources available in the past for agricultural research had to be thinly spread over a large number of items. It was natural in these circumstances that some disciplines and some crops received more attention than others.

Plant breeding has been one field where notable successes have been scored, even in the past. The average farmer also was quick to take to new varieties because, before the recent taking up of agricultural production on a more intensive basis in many areas, it meant only a change of seed, which he could afford, prices of seed being what they were at the time. A number of successful varieties were bred among them being the rice strains developed by K. Ramiah and others, the well-known Coimbatore canes with which the name of T. S. Venkatraman is associated and wheats like Pusa 4 developed by the Howards, C591 by Ram Dhan Singh in the Punjab and the "700 and 800 series" evolved by B. P. Pal and his co-workers.

During the last five years or so high yielding varieties of wheat and rice and equally high yielding hybrids of maize, jowar and bajra became available and have resulted in a considerable spurt in foodgrain production. In the case of both wheat and rice dwarf lodging resistant and fertilizer responsive varieties were introduced from abroad, *viz.*, Mexico in the case of wheat and Taiwan and the International Rice Research Institute in rice. These have, however, been followed by material developed in India which is more acceptable to the farmers because the grain quality of the important varieties was not liked by consumers in India. The hybrids in maize, jowar and bajra were developed within the country itself. In all cases the work became possible as a result of all-India coordinated research schemes sponsored by the Indian Council of Agricultural Research in which scientists both from Central Institutes, State Departments of Agriculture and Agricultural Universities have participated in a spirit of cooperation. The introduction of high yielding varieties has created enthusiasm among the farmers who have shown that they are quick to respond to worthwhile innovations provided these are capably demonstrated on their own fields. The new varieties, however, require higher standards of agronomic practices and adequate and timely supplies of requisite inputs such as fertilizer, irrigation, water, pesticides, etc. In fact, with the adoption of more intensive agriculture the problem of diseases and pests has become intensified because conditions under which ample fertilizer and water is used also favour the spread of many diseases and

pests. To deal with these problems special attention is being paid both in the coordinated research schemes to which reference has been made and in the research institutes where the basic aspects relating to plant protection are carried out.

The recent successes, however, have related mainly to the five foodgrain cereal crops which have been mentioned. Although some successes have also been achieved in evolving new potato varieties which are high yielding and more disease resistant than the older ones, as in some other crop or other economic plants, a great deal remains to be done. The places which in India are an important source of food particularly with regard to the supply of proteins, have not received sufficient attention in the past and it is urgently necessary to step up their yields. The oilseeds represent another group where there is a great shortage and concentrated attention is necessary to solve the most pressing problems. Again in the case of fibre plants, in fruits and vegetables, in spices, in medicinal plants, etc., there is a very large amount of work to be done. Following the success of the all-India coordinated project in research, the Indian Council of Agricultural Research has drawn up schemes to cover all the important food and industrially important plants including of course fruits and vegetables. The Council has also given thought recently to the question of giving impetus to research in the animal sciences including fisheries, as these areas also have not received sufficient attention in respect of research. They are vitally important to our country.

Most of the recent success in developing high yielding varieties of crop plants and agronomic techniques for realizing their potential covers only the irrigated areas or areas with an assured rainfall. As is well-known, nearly 80 per cent of our country is not covered by adequate irrigation and the problems of dry farming or non-irrigated farming are vast. The research base for providing a break-through in production is not yet there. The problems are more difficult because with insufficient water the problem of applying fertilizer safely assumes great significance. Therefore, during the Fourth Plan period it is intended to devote a great deal of attention to research on soil and water management because these are basic to greater agricultural production. We have not only to produce more for human beings and to feed our industries but also we require feeding stuffs for animals and poultry. It is, therefore, necessary to work out not only ways and means of increasing the yield per hectare of a particular crop but to evolve patterns which will give to the farmers the greatest return for his money and labour. Indeed, one of the most heartening features of the recent change in agriculture is the demonstration by research scientists

of the immense possibilities of multiple cropping in our country and the quick response from the extension agencies and the farmers to take this up wherever possible. The plant breeders are trying to breed strains of crop plants which can mature in a shorter period of time without undergoing the loss of yield. Again, it is well-known that certain plants react sharply to changes in light and temperature and therefore they can only be grown in certain regions and in certain seasons. But it has been shown that even in these crops there are certain varieties which are neutral to photo-periodism as it is called and these can be grown over a much wider range of conditions and at different times of the year. The plant breeders are therefore trying to incorporate in the new varieties these useful features in addition of course to high yield, good grain quality (including its nutritive quality) resistance to disease and pests and so on.

It is obvious that to achieve the objectives and targets which have been only very briefly mentioned, in general terms, a great deal of planning is necessary so that the available resources are utilized to the best possible advantage so that results may flow to the user in the shortest possible time. It is correct to say that at no time in the past has so much thought and attention been given to planning our agriculture in all its aspects. This is as it should be for ours being an agricultural country we have to see that the base—agricultural base—on which our country depends is strengthened so that our country and its people may proceed to an era of prosperity.

ORGANIZATION, MANAGEMENT AND PROGRESS OF MEDICAL RESEARCH

P. N. Wahi

THE economic and social development during the last two decades has brought about an imperceptible change in the health and disease pattern in the community calling for great efforts in providing and expanding the facilities for medical research in the country. The need for an increasing scope and variety of medical research was realized and to some extent met by the creation of institutes of post-graduate medical education and research and specialized medical research institutes under the Government and by encouraging research in medical colleges. The factors which deterred the smooth progress and expansion of medical research in the country in the earlier decades, such as lack of trained personnel, absence of governmental initiative in providing opportunities and funds, and the apathy of the medical colleges and the universities to the development of research, have been to a great extent overcome though much more remains to be done with regard to each one of these. The successive five year plans have laid great stress on the promotion of national health, and the crucial role that medical research plays in the promotion of health and welfare has been recognized. Constant attempts are being made to provide more and more funds for medical research though the resources have always fallen short of the requirements.

Historical Background

Before 1911, when the Indian Research Fund Association was created by the Government of India, there was no organized body to promote and coordinate medical research in India. Even so, significant contributions were made by medical men of the Indian Medical Service towards the understanding, treatment and prevention of communicable diseases. The first milestone of organized medical research was the creation of the Indian Research Fund Association (IRFA) in 1911, managed by a Governing Body presided over by the Health Member of the Viceroy's Executive Council. The IRFA with its limited resources was able to turn out useful work and, during the first four decades, efforts were made to understand the

causation, mode of spread and prevention of communicable diseases which were responsible for large-scale epidemics resulting in high morbidity and mortality. The actual investigations were carried out in the existing institutions with the help of *ad hoc* grants from the IRFA. Many of these institutions later on evolved into full-fledged research or training or vaccine-producing establishments.

A significant development during this period was the initiation of studies on nutritional deficiencies by the IRFA which led to the development of the Nutrition Research Laboratories, one of the foremost research institutions in the world, now located in Hyderabad, and which celebrates its Golden Jubilee this year. Some of the other institutions which have significantly contributed towards the development of medical research in the early years are the All India Institute of Hygiene and Public Health, Calcutta, Malaria Institute of India at New Delhi which has now been redesignated National Institute of Communicable Diseases, the Central Research Institute, Kasauli, Pasteur Institute, Coonoor, King Institute, Guindy, Haffkine Institute, Bombay, and the School of Tropical Medicine, Calcutta. Research in medical colleges, as it is understood today, was practically unknown.

In 1946, the Government of India appointed a Committee to review the whole field of medical and health facilities available and recommend the future development. The Committee—better known as the Bhore Committee —in its report pertaining to medical research brought out "the almost complete absence of organized medical research in various departments of medical colleges, deficiency of trained personnel to undertake research and progressively diminishing research activity of the specialized institutions in direct proportion to the increase in volume of routine duties...." To overcome these deficiencies, the Committee made the following recommendations: (*a*) establishment of a centre for post-graduate training and research, (*b*) setting up of special institutes for researches in specific diseases, and (*c*) creation of a statutory body for the purpose of formulating policies for the development of medical research in universities and selection and training of medical research workers in the country.

The most significant development following the recommendations was the establishment of the Indian Council of Medical Research, the successor organization to the IRFA in the year 1949. The Council has during the last two decades completely revolutionized the pattern and scope of medical research in the country.

Organization of Medical Research

The bulk of the medical research in progress in different parts of the country, in its various institutes and universities, medical colleges and hospitals is supported by the Indian Council of Medical Research. To a small extent medical research is supported in many of the States in India through their respective State Medical Research Boards who restrict their sponsorship to investigators working in the institutions located in their own States. Usually, the support is limited to a small financial grant to study some specific medical or health problems of local interest. While some of the States still do not have medical Research Boards, several others who have them find that the financial resources to support research are hard to come by. The existence of the State Medical Research Boards does not preclude any investigator to approach the ICMR for support.

Bio-medical Research is also supported by the Council of Scientific and Industrial Research and undertaken to a variable extent in their own institutions. Mention should be made of the Central Drug Research Institute, Lucknow, Indian Institute of Experimental Medicine and Biochemistry, Calcutta, Central Public Health Engineering Institute, Nagpur, and Central Food Technological Research Institute, Mysore. These laboratories have so oriented their programme of work, that the medical and biological research carried out by them largely serves the needs of the technological and developmental wings of the institutes and the related industries.

In recent years the larger pharmaceutical firms and a few food-based industries have established excellent laboratories for research on problems of interest to them and also extend some support to clinical and laboratory research in the different medical institutions. While these efforts are to be appreciated, there is a need not only for more of these private sector institutions to come forward to support research but also allocate a larger percentage of their resources for research expenditure.

The Armed Forces Medical Services have their own Research Committee and carry out research projects of importance to them in collaboration with the Defence Science Organization. The Armed Forces Research Committee and the Defence Service Organization have also developed active programmes of research jointly undertaken with ICMR or other appropriate research agencies. Significant advances have been made in the field of war medicine and biology of warfare and these have indirectly helped to enrich the different facets

of medical sciences. These developments have, in turn, stimulated medical scientists in the country to study and unravel problems of interest in diagnosis, prevention and treatment of diseases in civilian life.

The Directorate General of Health Services which is the technical wing of the Ministry of Health and who are incharge of the country's health services carry out from time to time some special studies in the nature of operational research on problems of national importance. The medical institutes administered directly by the Ministry of Health at the centre and those run by the State Governments are largely devoted to the manufacture of vaccines, sera and other biological re-agents and also provide diagnostic and other public health laboratory services to the community. Even so, the scientists working in these institutions perform some research work related to the activity in which they are engaged. The ICMR provides financial support to them for some specific projects which otherwise could not have been undertaken due to paucity of their own resources.

The Indian Council of Medical Research

While there are several agencies supporting medical research as indicated already, the ICMR is the only organization which has played and continues to play a pivotal role in the growth and expansion of research in the country. The Director-General of the Council is represented in all the research bodies including Committee on Science and Technology which is the scientific advisory body to advise the Cabinet, and this has made it possible to coordinate the research efforts and avoid duplication. The present Director-General is also a member of the WHO Advisory Committee on Medical Research.

The Council is controlled by a Governing Body presided over by the Health Minister of the Government of India. The Governing Body is assisted by a Scientific Advisory Board which, in turn, appoints Expert Advisory Committees and *Ad Hoc* Groups to advise the Council in its research programmes and evaluate the projects undertaken in different fields. There are at present over 30 expert committees and 6 *Ad Hoc* Groups helping the Council in the task of formulating programmes of research in various biomedical disciplines. The expert members of these committees are outstanding scientists known for their contributions to medical research in their special fields and usually derived from science and medical faculties of the university. They work in an honorary capacity.

Currently, the Council is supporting over 500 research projects costing nearly 20 million rupees for the year 1969-70. The Council maintains the following research Institutes from its own funds—the Nutrition Research Laboratories, Hyderabad (now designated as National Institute of Nutrition), the Virus Research Centre, Poona, the Tuberculosis Chemotherapy Centre, Madras, the Cholera Research Centre, Calcutta, the Indian Registry of Pathology, New Delhi, the Occupational Health Research Institute, Ahmedabad, and Institute of Reproductive Biology, Bombay. Besides, the Council supports several research units as well as *ad hoc* research projects. The projects receiving support cover a wide front and include the study of epidemiology, treatment and prevention of several bacterial and virus diseases, problems in the field of environmental hygiene and occupational health, clinical and public health nutritional problems, projects in the field of clinical and experimental medicine, drug research including indigenous drugs, clinical trials, researches relating to reproductive biology and fertility control covering basic, applied and field studies, and fundamental researches in the field of basic medical sciences.

Realizing the great need for maintaining and upgrading the quality of medical education in the face of expanding medical educational facilities and for providing the best public health administration and service to community which is largely spread out in rural areas, the Council has recently established two expert groups on Research in Medical Education and Research on Health Practices, and has sponsored researches in the field of medical education and public health administration to study and answer specific problems in these important areas.

The Council depends for its financial support entirely on the Government of India. However, it also receives assistance for research projects from International agencies, such as Ford Foundation, Rockefeller Foundation, WHO, FAO, UNICEF and USAID in addition to support from PL-480 funds. The budget of the ICMR is 3.8 per cent of the Health Ministry's budget and compares very unfavourably with the CSIR budget (19.6 per cent of Education Ministry's budget) and the ICAR budget (10.6 per cent of the budget of the Food & Agriculture Ministry). This has been the main reason why the medical research cannot claim an impressive record in the country.

Each year over 50 per cent of the Council's budget is spent in the study of national health problems which include, in addition to the communicable diseases, malnutrition, reproductive biology and fertility control, and maternal and child health. The administrative charges

normally do not exceed 10 per cent and are usually between 6 to 7 per cent of the total budget. About 25 to 30 per cent of money is used in financing research projects on clinical and experimental medicine and basic medical sciences. The other programmes, such as the Fellowship, Career Scientist, Emeritus Scientist, etc., get an allocation of about 5 per cent of the total funds.

To expand and enlarge the research activities and promote a spirit of enquiry and research outlook among teachers in medical faculties, the Council took a series of steps, such as holding research workers, conference in peripheral institutions, organizing the annual meetings of the Scientific Advisory Board and its expert groups in the various medical colleges each year and conducting and supporting special symposia, seminars and workshops based on current and tropical problems. These efforts have given a tremendous boost to medical research in the medical colleges, and today the Council is receiving a large number of projects for financial support from the different departments of the medical colleges. The opportunity to meet and mix with senior medical scientists of the country, to discuss with them the various health and medical problems of local as well as national interest, and hear and take part in lectures and seminars had helped the young teachers and post-graduates to appreciate the need to participate actively in research programmes.

The fellowship programme of the Council offering various types of fellowships has also played a vital role in giving opportunities to young men and women to take up research as a career. It is a matter of great satisfaction that several of the early research fellows are holding important research or teaching positions today. While the ICMR has been a valuable training ground for young research workers for many years, it is only recently the Council has created a research cadre, so that the best talent in the country could be absorbed to become the nuclei of competent research workers. Some of the other steps taken by the Council for promotion of research are the creation of supernumerary cadre posts, introduction of the Emeritus Scientists programme for the eminent senior and active scientists, and the research sabbaticals for the working professors.

Progress and Achievements

The sustained and devoted work of our scientists over the years had led to the understanding of the epidemiology, prevalence, cure, control and prevention of some of the killing diseases like plague, malaria, kalazar, rabies, smallpox, cholera, enteric fever, tuberculosis, and

leprosy. The country has reached today the stage of near eradication of plague, malaria and kalazar, and efforts are being directed now to keep a constant vigilance against their recrudescence. A large volume of technical know-how for the control of diseases like smallpox, cholera and enteric fever has been developed. The recent field studies using oral typhoid vaccine for prophylaxis against enteric fever have shown some promise and it is proposed to continue the experiments with some modifications in the dosage schedule to get better results. The pattern of cholera incidence has shown a welcome change, the virulent infection with vibrio having given place to a milder type of disease. Active studies are in progress to improve the immunogenecity of cholera vaccine including preparation of oral vaccine developed on the basis of genetic studies and clinical trials with the same. Research work in the chemotherapy of tuberculosis has shown convincingly the value of supervised home therapy compared to hospitalization and treatment. The success of DDS prophylactic treatment of contacts towards control of leprosy has given encouraging results and already steps are being taken to adopt this procedure in leprosy control projects.

The Council has a programme of collaboration with the World Health Organization to study the genetic control of mosquitoes and other insects which pose serious threat to human health. The presently available methods of insect control, using both insecticides and elimination of breeding sources have serious limitations not only because of their high cost but also due to the development of insecticide resistance. Recent research developments have offered promising techniques using chemical as well as ionizing radiations as agents to sterilize the insect.

In the field of virus diseases, significant progress has been made not only in mapping the vector species of mosquitoes and other arthropods which are responsible for the epidemics of virus diseases, but also in developing techniques for diagnosis in respect of several strains of virus which facilitate early isolation of the causative agent during epidemics and control its further spread. In the case of a few conditions, our scientists have developed vaccines or improved the existing ones.

The Council with the support of World Health Organization is establishing facilities for epidemiological surveillance including serological studies with the help of serum banks. The programme is expected to provide valuable data useful for effective and economic control and prevention of the common communicable diseases. The multipurpose serological surveys are expected to provide information

on the incidence and prevalence of several important infections by the examination of single serum specimen. This will enable the assessment of the immune profile of the population and will enable in drawing up sound vaccination policies. The data will also help in the control and prevention of communicable diseases on a long-term basis. Apart from these practical uses, the material obtained will be of immense value for the further development of immunological and genetic research.

Major advances have been made in our understanding of the problem of malnutrition and how to prevent them. The excellent studies on protein and vitamin A, malnutrition in children, anaemias in pregnancy and childhood, goitre in the foothills of Himalayas, the problem of lathyrism and other food toxins, and endemic pellegra in the jowar eaters have yielded valuable data for initiating control programmes. Already effective programmes are in operation to prevent goitre, and active steps are being taken to launch programmes to prevent the other types of malnutrition mentioned above.

Faced with the challenge of extensive population increase, research activity in this area has shown a welcome expansion during the last few years. Apart from basic studies on the biology of reproduction and fertility, the research workers are actively participating in studies to evaluate the various available contraceptives and to prevent their side effects and other complications. The Council has also organized a training programme in reproductive biology for teachers and active workers in the field of family planning from India and other South East Asian countries.

Sustained interest has been evinced over the last few decades in the development of effective but safe drugs, both synthetic and indigenous. The discovery of *R. Sarpagandha* has re-awakened interest in the rich heritage of our herbal remedies. In recent years, the Council has coordinated intensive multi-disciplinary research on selected drugs through its Composite Drug Research Project. Potent active principles obtained from 6 out of 38 herbs studied, are now under extensive clinical trials. Shortly it is proposed to establish a Pharmacological Laboratory in the ICMR for systematic screening of drugs for their efficacy, toxicity and even late carcinogenic effects. Ultimate progress in this field will, however, depend on the enthusiastic response of progressive pharmaceutical houses in increasing allocations for drug research if the country is to reap the benefits of the endeavours of the Council.

In the field of clinical research, notable contributions have been made on the subject of portal hypertension, cardiovascular surgery, pulmonary function under stress, diet and atherosclerosis, hereditary, haemoglobin defects, blood group immunology, liver diseases, epidemiology of cancers of oral cavity, and uterine cervix, dental diseases, fluorosis, mental disorders, diabetes, etc. The knowledge gained on the basis of these studies have greatly influenced the service and training programmes in the hospital and medical colleges.

Realizing that with increasing longevity of life and control of communicable diseases, cancer would soon be a major public health hazard, the Council has constituted an Expert Group on Clinical & Experimental Oncology to augment cancer research in the country. A consultative committee for coordination of cancer research in the country has also been constituted by the Council. Another field in which the Council is stepping up research and training is Exfoliative Cytology—and investigative procedure essential for early cancer detection and follow up of the women using contraceptives. The Council is organizing symposium on Exfoliative Cytology and a Workshop and training programme for Cytopathologists and Cytotechnicians.

Indian Registry of Pathology

In any community purposeful clinical research should take into account the existing pattern and quanta of morbidity and mortality. Unfortunately authentic information is often unavailable in the country. To fill the lacuna, the Council has undertaken several epidemiological studies. More recently, it has established the Indian Registry of Pathology with its constituent registries of Hepatic Pathology, Neuropathology and Osteo-pathology. It is also entrusted with another function of preparing teaching aids in pathology to meet some of the long-felt needs following the rapid expansion of medical colleges after Independence. It is further envisaged that the Registry will be able to organize a consultative machinery to provide expert pathological opinion on debatable tumours, etc. After its recent reorganization, the Registry is expected to play a vital role in the promotion of clinicopathological research in the country.

Research in Basic Medical Sciences is comparatively young in India and a few centres distributed all over the country and possessing all the necessary facilities have excellent programmes of fundamental research in progress in their departments. The growth and expansion in this field will take some more time and will be dependent on the

availability of sophisticated equipment and other facilities which require considerable amounts of money. To promote fundamental research the Council has constituted two new expert groups on cellular and molecular biology and immunology and human genetics.

Service for Research

For the successful progress and development of medical research, our scientists need a variety of ancillary services and support. The most important among them are the publication of good scientific journals, creation of library facilities, and availability of scientific forum to meet and discuss scientific problems at regular intervals. The country has made great strides on all these fronts and today we can boast of the existence of professional medical and biological societies in almost all the different specialities. Most of these societies bring out their own scientific journals which publish the research work in that speciality in addition to holding annual conferences, symposia and seminars. The ICMR aids medical investigators through its service units on Laboratory Animal Information Service, Bombay, Microfilm and Photo-copying Unit at Kasauli, Tissue Culture Unit at Poona and the Divisions of Publication and Information and Epidemiology and Communication at the headquarters. The Council has its own official research publication—the Indian Journal of Medical Research which has been in publication continuously since 1913. The ICMR has a general medical library for nationwide use at Kasauli. It is proposed to transfer this library and the Council's documentation unit to the headquarter's building so that it could be a useful adjunct to the newly created division in disseminating scientific knowledge.

In conclusion, it may be stated that in spite of limited resources and lack of some of the costly and sophisticated equipment, our medical scientists have made significant contribution, and medical research has shown a steady and welcome expansion during the last two decades. With the greater emphasis on scientific research and effort to give the necessary academic freedom to our scientist and research workers, medical research in India can hopefully look forward to even more effective contributions.

ORGANIZATION, MANAGEMENT AND PROGRESS OF DEFENCE RESEARCH AND DEVELOPMENT

S. Bhagavantam

SPECTACULAR developments in the scientific and technological fields during the past few decades have not only profoundly influenced all human activity on this planet but have also enabled man to conquer the outer space. Break-throughs in science and technology are being simultaneously exploited on an unprecedented scale towards developing more lethal weaponry and counter weaponry, thus revolutionizing the concepts of warfare and largely influencing the defence policies of nations. It is no wonder that in the race for technological supremacy, countries spend large chunks of their national wealth towards research and development for defence. In order to safeguard our national integrity and for the purpose of defending our frontiers, there is an imperative need that our Armed Forces should be equipped with the latest and most effective weapons and equipment and this will in no way be against our policy of peace.

In India, the need for making the Defence Services self-sufficient and self-reliant was recognized soon after Independence. A nucleus Defence Science Organization was set up in 1948 in the Ministry of Defence, to deal with the basic aspects of scientific problems affecting the Services. A major reorganization was, however, affected in 1958 when the present Defence R & D Organization came into being by amalgamating some of the existing Technical Development Establishments with the Defence Science Organization.

From a handful of laboratories/establishments in 1958 with very meagre facilities for R & D work, the organization has grown into 30 and odd major establishments/laboratories embracing practically all scientific and technological disciplines of defence interest. Considerable competence and facilities have been developed at these establishments towards undertaking defence-oriented R & D tasks based on the requirements of the Services. However, in some of the more sophisticated fields like missiles, aeronautics and naval research, some gaps have still to be covered to attain the necessary 'take off' level because of the complexity of the equipment and large outlays involved.

The Defence R & D Budget has grown progressively from 1958 onwards and has virtually more than trebled itself during the period 1962-63 to 1969-70, rising from Rs. 5.2 crores to Rs. 15.2 crores. It is expected that with the anticipated build-up of R & D facilities, this expenditure would be of the order of Rs. 30 crores by the end of 1973-74. The number of R & D projects/studies in hand have also grown in the past to a similar extent. The current level of expenditure on Defence R & D in India is, however, still very low being of the order of approximately 1.3 per cent of the total defence budget, as against much bigger outlays by the more advanced countries.

AIM OF DEFENCE R & D

As a supporting organization for the Services, the broad aim of the Defence R & D Organization is to design and develop new and sophisticated equipment based on the operational requirements, to help in their indigenous production as well as to provide scientific support to the services in solving the physiological, psychological, food and other problems of the Jawans. The R & D activity of the organization thus stems directly from the problems posed by the Defence Services and a task is taken as having been successfully completed only after the hardware developed has been evaluated, accepted by the user Services and its production established. Defence equipment have to satisfy stringent functional and performance parameters against the diverse environments of our operational frontiers, extremes of temperatures and humidity, high altitude and intense solar radiation, etc. Moreover, with advancing technology, defence equipment tend to become obsolescent very rapidly and hence there is invariably a race against time to develop the items to meet firm target dates. Thus putting a Defence R & D task through the paces, whether it be design of a sophisticated weapon or electronic equipment or a problem concerning food or clothing of a soldier, presents no small a challenge to the ingenuity of the scientists.

STRUCTURE AND MANAGEMENT OF DEFENCE R & D

The Defence R & D Organization functions under the overall control of Department of Defence Production in the Ministry of Defence and like any other Government department is governed by the rules and regulations prescribed for various types of activities. The organization follows a 2-tier organizational pattern, same as Defence Services in general, *viz.*, (*i*) a Headquarters set-up responsible for policy direction, control and coordination as well as liaison with the Services HQ forming a part of the overall Defence Headquarters; and

(*ii*) a large field set-up comprising Research and Development establishments and laboratories, each of which is responsible for research and development pertaining to an assigned range of defence equipment or an assigned area of scientific research of defence interest.

For the sake of convenience, these R & D units are grouped into certain broad functional groups with the corresponding divisions at R & D HQ, each under a Technical Director. These technical divisions at present are: (*a*) Armaments (including instruments and metallurgy); (*b*) Electronics; (*c*) Engineer equipment; (*d*) Aeronautics; (*e*) Vehicles; (*f*) General Stores and Clothing; (*g*) Naval Science & Technology; (*h*) Medical Sciences; (*i*) Research Laboratories Group concerned with Materials Research and research in other scientific problems of defence interest. A Directorate of Administration also functions as part of the R & D HQ. Apart from this, senior scientists are attached to the three Services HQ as Scientific Advisers to render advice on day-to-day scientific/technical matters.

The whole organization is under the Director General of Defence Research & Development, who is its chief executive and is vested with adequate administrative and financial powers for day-to-day administration of the organization. The DG, R & D, is also concurrently the Scientific Adviser to the Defence Minister. He is assisted, at the Headquarters, by a Chief Controller, who is a senior Service Officer responsible for the coordination of R & D programmes with the Services and a Chief Scientist responsible for overall scientific coordination. The three together constitute top level Management Group of the Organization.

The Directors of R & D Establishments/Laboratories, who are senior scientists or qualified Service Officers, are responsible to initiate measures for adequate build-up of competence, staff and facilities for undertaking of R & D tasks within their field of activity, keeping in view the immediate and futuristic requirements of the Services. There has been a gradual decentralization of both administrative and financial powers from the DG, R & D, to the Heads of the Establishments/ Laboratories in keeping with the accepted policy of locating adequate authority at the point of responsibility. As administration in the field of science and technology remains a ticklish matter, the position in regard to matching of responsibility with powers is kept under constant review to facilitate speedy execution of R & D tasks. Further, with the formation of Governing Councils for these Establishments/Laboratories and with adequate administrative and financial powers having

been vested in them, it is envisaged that delays inherent in govern mental machinery, will be largely overcome.

The Technical Directors at R & D headquarters have an importan role to play in the management ladder. Whereas, on the one hand, the: assist the R & D top management in the overall policy direction an(execution, on the other, they have to maintain close liaison with th Services HQrs to ensure that the R & D projects are chosen properly an(they progress smoothly with the injection of user's opinion at all stages They also provide the HQ assistance to the Establishments/Labora tories in meeting their requirements of manpower and facilities an(in doing so, maintain liaison with the Ministry of Defence and Financ((Defence). The role of the Technical Directors is thus complementar: to that of the Establishments/Laboratories and they jointly constitut(the machinery for middle-level management of R & D effort.

Most of the R & D tasks are of a multi-disciplinary nature and a such their execution requires team work and pooling of knowledg(and expertise from different technologies and scientific disciplines Such multi-disciplined tasks are broken up into sub-tasks and assignec to the concerned Establishments/Laboratories through the HC Director concerned. A project coordinator who coordinates the mair aspects of the activity ensures that the overall systems developmen is not lost sight of. Moreover, while individual scientists have th(freedom to exercise their initiative towards fulfilment of this cooperativ(effort, this has to be done within the boundaries of the assigned tasl and its target date.

POLICY DIRECTION

Apart from the normal channels of guidance and direction fror the DG, R & D to the individual Establishments/Laboratories whicl are catered for in the organizational structure, there exists a network o Councils and Panels composed of User Services, R & D, Productioı Agencies and eminent scientists and experts from the country, for prope: orientation and guidance of the overall defence R & D effort.

R & D Council

At the apex is the Defence R & D Council which functions unde: the Chairmanship of the Defence Minister and is responsible for layin down the broad policies and for effective direction of the R & I effort. Such a body with some measure of internal autonomy, has beeı found to be more effective than the normal machinery of a Ministry

for proper growth of scientific and technological output. The Council which has 12 members, including some eminent scientists, and enjoys fairly wide powers within the framework of the overall Government policies.

R & D Panels

There are in existence 11 different R & D Panels which function at the HQ level for different fields of R & D activity. These Panels provide a useful forum for all concerned agencies, closely connected with the development-production cycle, to review the progress on individual R & D projects, adopt measures to resolve the inter-stage bottlenecks and to suggest steps to ensure smooth and speedy progress. The Panels, in addition, lay down and revise, as appropriate, the target dates and priorities including *inter se* priorities for the various R & D tasks which then become binding on all concerned agencies.

Governing Councils

With a view to confer a greater degree of autonomy to the different R & D units, Governing Councils have been recently constituted for different groups of Establishments/Laboratories engaged in similar and allied fields of work. These Councils function at the Establishment level and have been vested with adequate financial and administrative powers. Broadly speaking, the Governing Councils provide the establishments the necessary scientific and technical guidance for the execution of the assigned tasks and the wherewithal to tackle such tasks in accordance with the programmes and target dates stipulated by the respective R & D Panels. The Governing Councils thus accept/recommend measures for the provision of necessary facilities, equipment, manpower, training and accommodation, etc., which would enable the respective Establishments/Laboratories to execute the assigned tasks speedily and to undertake futuristic tasks for the Services, on a progressive scale.

PERSONNEL POLICIES

The Organization is manned by both civilian scientists, technologists and selected Service Officers of all the three Services. This mixed composition fully subscribes to the principle that the shaping and execution of scientific research and development for the defence Services results from the continual interplay of the viewpoints of the Military experts and the scientists at all stages. The Apprenticeship Training Scheme ensures continuous and regular intake of young scientists into

the organization. Under this scheme, young scientists for all disciplines are put through a period of training to acquaint them with the scientific and technical requirements of the Services before absorption into service. In addition, scientists are attached to active units/formations of the Services, to get first-hand knowledge and information about the actual conditions of operation of soldiers on the frontiers and their equipment. Selected scientists are also given a period of attachment with the production units to acquaint them with the production problems and techniques of mass production.

Adequate opportunities are provided for training of scientists within the country and abroad in specialized fields of defence requirements. In keeping with the aims and objectives of the organization, all opportunities are given to the scientists for creative work and suitable incentives have been provided for recognition of outstanding work and achievements. The career prospects in R & D Organization compare favourably with those prevailing in other scientific organizations in the country.

The Service Officers employed in the organization are initially employed on tenure basis and those having the requisite qualifications, ability and flair for original work, research or development, are permanently absorbed.

PLANNING FOR R & D

Within the framework of Government policies for the defence of the country, the respective Services spell out their immediate and, as far as feasible, the futuristic requirements of weapons and equipment. Major policy issues get resolved through a network of Committees which exist at various levels in the defence set-up with which the Scientific Adviser and other senior officers from R & D are associated. The planning of R & D programmes to meet the immediate and long-range requirements of the Services, therefore, follows in the wake of the plans drawn up by the Services subject, however, to any changes that may be needed by the Services from time to time to accommodate changes in their operational and technical requirements. In this way R & D tasks to be undertaken in the various units of the Organization are embodied into a 5-year rolling plan of action, in consultation with the concerned agencies. The bulk of the work tackled by the R & D Organization relates to development of hardware and most of the research activity within the Establishments/Laboratories is, therefore, by and large, of the aimed type of applied research. Basic research undertaken in any branch

of science is necessarily of a limited nature and efforts are made to farm out such activity, as far as possible, to appropriate civilian institutions in the country.

Any R & D activity culminating in the production of hardware has been very aptly described as an innovation process, following a number of steps from basic research, through applied research, invention, development, prototype fabrication and production. So far as defence R & D is concerned, there are a number of agenices which play an important part in this innovation chain, *viz.*, the users who are the chief customers, R & D and the inspection and production agencies. Since arms and equipment become obsolete much faster than newness can be injected into them, the ultimate success in this venture depends to a very large extent on how fast technology catches up. For undertaking major projects for the Services which require sizable R & D effort and outlays, it is therefore imperative that adequate 'lead time' must be available, which should also cater for production tooling up and establishment of production, as only after this can the item go into the hands of troops. All this, therefore, entails that Services have to think of their long-term requirements sufficiently in advance, as otherwise it might turn out to be an exercise in futility.

PROGRESS AND ACHIEVEMENTS

A large number of research and development projects handled by R & D Organization have culminated in the indigenous development of weapons, equipment, stores and materials for the Armed Forces resulting not only in considerable saving in foreign exchange but also in providing the Armed Forces with better and more effective weapons and equipment. Some of the major items of armament equipment developed are the new mountain gun, a semi-automatic rifle, an anti-tank mine, a charge line mine clearing and various types of ammunition, explosives and propellants, various types of power cartridges for the Air Force, and signal cartridge and drill mines for the Navy. In addition, a large number of instruments used in conjunction with weapons and some medical instruments have also been developed, some of which are being produced on pilot plant scale.

In the field of electronics, the important items developed are the field artillery radar and its simulator, wireless sets of various types, a local warning radar system, a mine detector, various types of charging and generating sets, and a Sonobuoy for the Navy.

In the field of Engineering equipment, a pneumatic assault boat,

recce boat, high altitute prefabricated shelters, a bridge erection boat, and a pressurized chamber are some of the important achievements.

In the vehicle field, a large number of tasks relating to "indigenisation" and improvements to Vijayanta tank have been tackled and various types of trailers, specialist bodies and "kittable" bodies have been developed.

Various types of compo-pack and survival rations and pre-cooked and preserved foodstuffs have been developed for troops working in high altitudes and isolated regions. In addition, a number of new materials vitally needed by the Services have been developed indigenously which include engine starting aids, lubricants of various types, corrosion preventives, cathodic protection system in Indian Naval Ships and storage tanks, solid kerosene and so on.

In the field of Scientific Research, a good many of physiological and psychological problems relating to men operating in different regions have been successfully resolved. Further, in order to meet the requirements of troops operating at high altitudes, a large number of problems concerning performance of weapons and equipment, vehicles and clothing, etc., have been tackled and solutions found.

A good deal of effort of the R & D Organization has also been directed towards developing suitable indigenous substitutes for imported materials, propellants and components required for the production of weapons and equipment for the Armed Forces, resulting in a considerable measure of self-sufficiency and large savings in foreign exchange.

LIAISON WITH SCIENTIFIC COMMUNITY

The Organization maintains close liaison with the mainstream of scientific and technological activity in the country by organizing and participating in symposia and seminars on topics of defence interest. Apart from nomination of scientists and experts from outside on R & D Panels, Committees and Governing Councils, scientists from R & D Organization have also been nominated on the Committees/Governing Councils of CSIR and other institutions in the country. In addition, specific tasks of defence interest have been farmed out to the CSIR Laboratories, Universities and other scientific and technological institutions in the country. There are at present 165 such projects and tasks currently in progress under this scheme at various institutions outside the Defence set-up.

CONCLUSION

It is universally recognized that scientific effort is difficult to measure in terms of profit. The Defence R & D Organization during its comparatively short period of existence has been able to create the necessary base of competence and facilities for meeting the Services requirements of new weapons and equipment and has also been instrumental in developing a number of such items. Though the investments in Defence R & D can be considered to have started to pay-off, a lot more still remains to be done to narrow down the scientific and technological gaps in the more sophisticated fields. This can be done with a concerted all-out national drive and by harnessing all available resources, so that our Jawans may have the most modern weapons within the realms of science.

CREATIVITY IN SCIENTIFIC INSTITUTIONS

M. L. Dhar

IN the evening of July 20, this year, a group of elder American scientists sat watching, with abated excitement, televised pictures of the landing of the U.S. spacecraft on the moon. A young American student, in his late teens, came casually along and watched the television for a moment with apparent unconcern and when asked if he was not excited about this historic feat, the young man said "Oh! this is impressive but the excitement lies way ahead on the moon itself and beyond it". The telling words of this young American are characteristic of how a generation of young men and women, brought up in a society where science is a way of life, is oriented for the challenges of the future.

In the West, science ceased to be the idle pursuit of the sophisticated few several generations ago and it was recognized as being the principal means for the all-round future development of mankind. With this recognition came the realization of coordinated planning in pragmatic teaching of science at the school and the University and a concerted effort by society to harness appropriate means to further the growth of science and technology. The few raised brows, of the tradition bound, vanished quickly as the results of investment on science started coming in the form of better motivated human beings and general all-round improvement in ways and means of living.

It is recognized that science spells today, inescapably high investment in men and materials and neither of these are grudged by the grateful beneficiary societies of the West.

Science is among the hardest task masters and among human pursuits the slowest to mature, particularly in the minds of the tradition bound. Scientists cannot indeed be produced overnight and, barring a very few exceptions, a scientist must be nurtured in much the same way as a delicate, sensitive and highly fastidious seedling has to be handled from the first day of its germination. Society must constantly strive to provide appropriate tools and appropriately dedicated and competent teachers at the school and the University so that when a young scientist enters the portals of creativity he is suitably equipped to take up his new challenges.

Quite early in the history of evolution of science, people in the West recognized that science-based technology was the surest way to human progress and earnest efforts were made, and indeed continue today, to coordinate the efforts of the scientist and the technologist. The university, the centres of research and technology, and the industry constitute, in advanced societies, the three legs, of equal importance, of the tripod on which rests the edifice of science and technology. Indeed, the freer the flow of information from one to the other and the less restricted the movement of scientists and technologists from a university to the advanced centres of research and industry and *vice versa* the faster and more assured are the results of this conjoint effort.

Often there is a discussion about the relative roles of fundamental science and technology in a developing society. It is necessary to remember that the lingering snobbery associated with fundamental sciences is outmoded and we must get rid of the vestiges of such attitudes. It must be understood that to a technologist, as to a pure scientist, his work represents an adventure, which in his case involves thoughtful planning such as may lead to a product or product improvement, whereas the esoteric scientist may move from thought to further purposeful thinking. In fact, a technologist's thinking is oriented to pragmatic achievement such as may be picked for direct application to the advantage of his fellow beings. Yet basic science has to provide the necessary scaffolding and precision to the thought process of the technologist and must, therefore, retain its primary importance. The two must run parallel and in consonance with a constant and meaningful dialogue between the basic scientist and the technologist to make for a harmoniously blended effort for human growth.

In developing countries some effort has gone into organization of teaching and research in science. Historically, in these countries, organization of technology has followed and not run concurrent with the organization of basic sciences. This has been a disadvantage as has been evident in this country. Whereas, before Independence, we had some kind of a take-off pad for basic sciences, we had practically no base for the in-training of technologists in our universities. And, when with the dawn of Independence we became conscious of the need for industrial growth, we turned to scientists, trained in pure sciences, to handle our technological problems. The results could obviously not be altogether satisfactory, and rather than ponder the reasons, we questioned the competence of the pure scientist for not doing too well what he has never trained or motivated to do. Fortunately, we established a few technological institutions and introduced technological curricula in some of our universities in late fifties and there are now

beginning to be available competent technologists, who may rightfully handle technological problems, and the country may look forward for a pay-off from the investments which have been made in the establishment of these Institutes and departments of technology.

It has to be remembered that however important the promotion of technological research may be for a country, it is vitally necessary that the country does not hitch itself to other countries for the development of basic sciences. Indeed, denial of opportunity to basic science to develop can only cut against the interests of a nation; for the development of basic science alone can provide stimulating ferment for intellectual growth and the evolution of better human beings which is, after all, the purpose of all human endeavour.

Role of society in the development of science can be decisive. Society has to provide the means for effective training of the scientists of the future and it has to accept that whereas a scientist is as human as anyone else and his requirements are not less than anybody else, he is infinitely more sensitive to praise and reproach and society has to egg him on by an occasional gentle pat.

A scientific institution is not just a brick and mortar structure decorated with expensive pieces of equipment, all of which are indeed the primary tools for a scientist; it is essentially an assembly of scientists organized towards an objective. The better the calibre of these scientists, the more intense their involvement in research and the more their consciousness of the need for coordinated functioning, the better will be the institution.

A scientist should in an ideal environment be free to do whatever stimulates him and pursue his work unencumbered by any institutional or state directive or even national allegiance. Yet, howsoever we may wish to encourage this, our national requirements and fiscal limitations must dictate priorities. Indeed, there is nothing wrong in laying down these priorities as long as we lay equal emphasis on the overall development of both pure and applied sciences so that these two branches run parallel and reinforce each other to the overall advantage of the nation. Even within these limitations, scientists can only be made out of motivated young people and it would be wrong to expect everyone to be motivated in the same direction, basic or applied, and in any case crowding in any one area would lead to lopsided development; a partially active brain is indeed not the best utilized brain and without hands a human being is a cripple.

It is thus evident that we must be clear about the objectives of any one institution in which a group of scientists and technologists may work. We must also endeavour to create in the institution a base of strong leadership of scientists fully committed to their respective subjects, and with transparent integrity in every department of human conduct. For establishing such a powerful base, we must remember that a scientist is not a recluse and social pressures on him are not any less than those on any other person. He must, therefore, be adequately provided in the universally proven context that creativity flourishes progressively as the social encumberances of the scientist lessen. In the laboratories, we must provide the necessary wherewithal in the form of equipment and supplies, such as are vital for the development of contemporary science and we just must not expect great results from indifferently equipped laboratories. Often we tend to ignore this very vital factor and wonder why a scientist who does so well in a foreign laboratory fails us in our expectations when he works in a laboratory at home. It has to be accepted that science today is an expensive game but one that must be played so that the nation may move effectively forward.

Young entrants to research institutions must be appropriately trained and motivated in the areas of research interests of the institute. Inadequately trained young men and women rarely achieve a sense of real involvement in any area of scientific or technological research and they tend, in the long run, to constitute a liability to an institute. Furthermore, with the high degree of specialization in every department of science today, it is necessary to accept that, in general, the competence of the individual in a given area must exclusively determine the selection of new entrants to an institution. It would, indeed, be uneconomic to expect a young man, trained in and motivated for a purely basic science, to put his hands to a technological problem; a technologically trained person could do the job much quicker and very much better.

The management of research and technological groups in an institution have the pivotal responsibility of providing the young scientists and technologists appropriate leadership, in an atmosphere of disciplined, but not regimented freedom which must also be intellectually stimulating. The genius of the team leader must be in his ability to create in the young scientists a total sense of involvement in their scientific problems. There must be completely free and unfettered scientific discussions and whereas courtesy is desirable, it must not be imposed in scientific discussions and approach to scientific problems, and the discussions must be free of dogma and unacademic authority. Such discussions constitute the very basis of science philosophy and their

absence can only lead to the drying up of whatever initiative and individual scientist may have. In addition to intra-institutional discussions there must be strong forums for inter-institutional deliberations where working scientists, more particularly the younger scientists, may meet and discuss the subjects of their interest with their contemporaries elsewhere. This must further be strengthened by creating generous means for the scientists to participate in international deliberations wherever these may be held. In the fantastic race of science today, it is a truism that personal discussions with a group of investigators in allied fields, besides being extremely stimulating, are far more fruitful for obtaining clear awareness of contemporary research progress and of the small intricate details of a given problem than pouring over numerous journals for months on end.

Regimented authority in a research institution is plain negation of the spirit of scientific research. Those in authority in the various institutions must be entirely committed to the progressive all-round development of their institutions and their personal involvements must spell just that and no more. Authority must be dispersed liberally on a horizontal basis and it must be the constant endeavour of the institutional head to inspire confidence in his colleagues at all levels and encourage them to accept responsibility. An appropriately motivated, disciplined and responsible scientist or technologist is indeed the best oriented for promotion of scientific and technological endeavour and constitutes also a model incentive for his colleagues in any institution.

The degree of promptness in obtaining material supplies for the motivated scientist is a paramount factor for the continuous innovating performance. This tends to get bogged by the operational procedures laid down in the present day government regulations. An institution operating outside such regulations does invariably better in its scientific output and in the promotion of research incentive of its workers. It is, therefore, necessary that the pattern of these regulations is modified sufficiently to make their application pragmatically useful in the smooth running of a research institution.

Appreciation of the efforts of a scientist, at any stage in his life, acts as an incentive as no other tonic can, and helps enhance his creative faculties. Slighting comments on individual scientists or the whole community of them, particularly in the non-science press, can damage devastatingly the scientific aspirations of the scientist and throw literally a wet blanket over the much sought after promotion of incentives. In the interests of the development of science and technology in the country and in the interests of achieving the much needed

science consciousness in our society, it is absolutely necessary that castigation of the scientist is avoided even under provocation.

India is today in the fortunate position of possessing an adequately large number—larger than we have had at any time in our history—of mature, competent and able scientists and technologists, particularly in the middle and younger age groups, and the base for science and technology is well laid. All that the seniors and the society need do is to nurture them, help them forward with whatever means we can afford, and avoid, under all circumstances, creating any difficulties in their way or exploiting them in any manner. This is the nation's most valuable treasure and must be guarded jealously and augmented effectively.

CREATIVITY IN SCIENTIFIC INSTITUTIONS —THE PROBLEM OF JOB INCENTIVES

J. V. Rajan and S. K. Subramanian

AS progress is the prerequisite for survival in an unequal world, the initiative in thought and action is needed to change existing patterns. And creative thoughts and initiative have to come from all levels in order to produce the best results. That is why preoccupations with problems of job incentives, devolution of authority and responsibility, joint participation at all levels of management and development of creative thinking and action have become permanent features of the organizational set-up. The terminology "creativity" and "job incentives" are subject to a variety of interpretations and there is no single definition which conveys the full implications of the concepts. Job incentives take various forms and are closely related to the organizational objectives, whereas it is commonly believed that creativity is associated with an individual, his attainments, training and talents. Lack of even minimum incentives is not necessarily a hindrance for genuine creative achievements, and in fact many examples could be cited of major creative achievements mainly attributable to an individual's skill and ability than to other reasons. However, it cannot be denied that job incentive plans have a definite role in providing job satisfaction, which is essential for constructive or creative work. Job satisfaction may be described as a subjective feeling experienced by one in one's sphere of activity, but need not be indicative of success. Objectively one can be successful in the opinion of others and still feel no inner satisfaction in his work. This of course does not imply that outward signs of success cannot contribute to inner satisfaction, but there is seldom any guarantee that they always do. Therefore, job satisfaction and creativity are closely interrelated and although the proximate cause may depend on the inborn talents or skill of a person, job incentives have a vital role in bringing out the dormant creative potential.

A casual glance at the budget of any research laboratory would show that the major item of expenditure is by way of salaries and these usually represent 65-75 per cent of the total expenditure. Thus the research worker himself becomes the most expensive as well as the most important asset to the research institution; hence the factors that

motivate the scientists, the life blood of the institution, need special attention. In the long run the success of a research institution will depend not on the quantity, but on the quality of the ideas the research staff can generate. It is often said that the enthusiasm and vitality of the research staff are the two basic factors that can testify to the success of the research management. To be successful, the motivational systems should not only be capable of generating that enthusiasm, but also sustaining it.

At the outset it should be emphasized that the scientific institutions established in India have indeed been creative as will be seen from the spate of papers published, patents taken, new production achieved and the potentials for further production created. From what has been achieved already, it may lead to the complacent conclusion that all is well and there is no problem of job incentives. But there is no end to progress, and for a country like India, we have a long way to go. Technological progress in the developed countries is taking place at astronomical speeds and one has to run faster if one wants to stay in the same place. Therefore, for us in India, it is all the more important and urgent to enrich our creative capability and the problem of job incentives assumes special significance in this connection.

Creativity—Definition

The concept of creativity raises interesting problems of definition, scope and content. What is creativity? Creativity may be said to be the ability to combine known facts and ideas into a new pattern. Creativity has been interpreted in a variety of ways and some representative definitions are: "activity resulting in novelty and value"[1]; "that which results in something new, rather unexpected and non-trivial"[2]; "effective surprise"[3]; "obtaining a combination of things or attributes that is new or different as far as the creator or those about him are concerned"[4]. A most common feature of these definitions is that anything which is new, novel, or unusual may be creative. Bruner's definition[5] highlights an interesting aspect of creativity in that creativity is not merely an accident, but is the product of minds which have been carefully prepared. In a research institution the problems tackled are

[1] J. B. Wiesner, *Where Science and Politics Meet*, New York, McGraw Hill, 1963, p. 121.

[2] M. A. Coler, *Chemical Engineering News*, Aug. 15, 1966, p. 75.

[3] & [5] J. S. Bruner, *The Conditions of Creativity in Contemporary Approaches to Creative Thinking* (ed. H. E. Gruber, *et al.*), New York, Atherton Press, p. 3.

[4] E. V. Fonge, *Professional Creativity*, Englewood, Prentice-Hall, 1959.

manifold and the scope for creativity is very extensive. Creativity is not a rare commodity nor is it the domain of a talented few. One common tendency is to ignore the creativity aspect inherent in many phases of our work, the discovery of new methods, procedures, and techniques, improvements or variations on old methods and of existing inventions and products. Individuals can be intuitively creative without the knowledge of the creative process, *viz.*, preparation, incubation, illumination and verification. Formal education provides training in analytical or deductive thinking and in logical or evaluative thinking, but synthetic or creative thought is often neglected. Hence, there is a hiatus between creative potential and creative performance. If the dormant creative potential is to be channelled into constructive performance, the first important step is to identify the creative qualities. These are: an active and inquisitive mind, an innate urge to probe into rather than gloss over problems, a fertile imagination, a sound background of fundamental knowledge, and a capacity to 'fail' intelligently. It is often not realized that an intelligent failure invariably provides ample scope for creative thinking than success achieved at one stroke. There is nothing reprehensible about failures as long as they are detected in time and corrected. It has been aptly said that "panic of error is the death of progress". Speculations, hypotheses and theories, even when proved wrong subsequently, have invariably aided in the collection of much new knowledge.

Creativity springs from individuals but is nourished by environment. Creative individuals have no specific personality, but a few important personal traits could be discerned. The foremost amongst them is their dedication to work; next is their self-confidence. The others may be grouped as interest in abstract concepts; tolerance for ambiguity; independence from authority, scant regard for conventions, an inborn restlessness to do some thing different; and an abiding interest on a wide range of subjects. If we can accept the broad meaning adduced to creativity that it is something more than skill and capability, it at once becomes clear that the organizational set-up which encompasses the problem of job satisfaction or job incentives has a positive role to play.

Incentives—Defined

Broadly 'incentive' may be defined as any factor which provides the motivational force for action. "Incentives" are needed to attract talent, to retain talent, to secure and sustain a higher level of effort. The four important points which govern job incentives are: (*a*) the

provision of psychological security; (*b*) recognition—an appreciation of what one has done and reward commensurate with performance; (*c*) an opportunity for self-expression—an opportunity to participate and freedom to actualise one's capacity to the full; and (*d*) provision of facilities to widen the perimeter of one's job. These help bolster up the ego of the researcher and he is made to feel important. The incentives required for carrying out fruitful work are the provision of decent pay scales, enlightened supervision, proper training facilities, scope for promotion, status, definition of objectives, consistent staff and scientific policies, library, engineering and technical facilities, good equipment, assistance at lower levels, freedom from administrative routine, a well-planned and integrated interdisciplinary approach to the solution of problems and above all encouraging frank, free and constructive criticisms of policies, measures and solutions.

Requirements: A job incentive plan which has as its objective fostering of creativity in any R & D organisation should take into account, among other factors, the criteria for selection, induction, and placement of personnel; the provision of enlightened and progressive personnel policies aimed at ensuring a sense of participation and belonging to the institution; the effectiveness of continuous participation by the top management in the programme of work by means of joint consultations and discussions in areas of problem identification, selection, operation and successful completion; the criteria for unbiased evaluation of research results; the provision of a suitable forum in which every single programme of research work could be screened by persons devoted to different disciplines; establishment of a congenial environmental system and scientific delegation of authority; provision of an effective communication system; the provision of enlightened leadership which will mould the heterogenous thoughts, ideas and actions into concrete shapes and tangible forms of value; the setting up of well-tested standards of performance; the provision of suitable machinery to ensure smooth transfer of technology for commercialization of research results; and provision for weeding out managerial deadwoods and factors hindering creativity.

Recruitment procedures: Recruitment procedures depend upon the objectives of the organization. The personnel to be hired by an industrial research institution devoted to the operational sector of the concerned industry should have formal basic training in a selected discipline, combined with some in related subjects and preferably with an interdisciplinary education. The scope of the formal training required will vary according to the responsibilities with which the person is to be entrusted. It is a fallacy that research institutions should be

staffed exclusively with creative people. To be productive it should have members of heterogenous accomplishments, that is, people concerned with studies in breadth as well as in depth. A purposeful personnel policy aims to balance the ambitions and aptitudes of the person with the objectives of the organization and the recruitment procedures are to be designed to bring out his creative talents. By purposeful personnel policy we mean that the policy should be such as to be related directly with the objectives of the institution so that efforts of the personnel hired can be effectively channelled towards their achievement. The problem does not end with just hiring or putting the person on the job. The real job lies in making the person understand in clear terms what is expected of him and to secure his willing and whole-hearted cooperation in the common endeavour. Status, emoluments, congenial environment in the work place, well-organized auxiliary facilities are not adequate if the individual cannot be influenced to identify himself to be one with the organizational requirements and objectives. The feeling of oneness comes from a deliberate policy of the top management to satisfy the individual's urge for receiving attention. The recruitment of the right type of personnel is a very important task as, in the long run, a wrong selection would lead to inefficiency. Creativity can be enhanced by selecting co-workers of the right calibre who could stimulate each other. Training new recruits is yet another important function, because during this period their attitude to work and aptitudes, leadership qualities as well as their scientific ability could be evaluated systematically. The ability to think and argue by analogy is an important element in creative thinking which is essential for team work. Many a young researcher is often attracted to the job, not essentially for the pay but for enhancing his educational background and broaden his research background. Facilities for further academic studies and research would act as an incentive for attracting young talents. A purposeful policy also recognises the individual as an entity with his own ideals, aspirations and capabilities and not one amongst the rest.

Interdisciplinary approach: There appears to be no problem for which any one science can claim primacy in finding the right solution; instead the interdependence of the natural and social sciences is becoming more and more manifest. Therefore, incentive plans should provide for the establishment of a suitable forum in which scientists of various disciplines are associated and at which each item of the research work is discussed threadbare and a well coordinated plan of attack is formulated for its solution. The discussions may even take the form of 'brain storming' sessions at which every scrap of idea, thought, or suggestion is assiduously collected and examined. For example, a

research project which has been formulated on the basis of mutual discussions between a chemist, a chemical engineer, a value engineer, a cost engineer, an economist, statistician, and the top management, *viz.*, the Director of the institution, has a better chance of success at every stage of execution. Contacts with colleagues of dissimilar attainments and experience have proved to be capable of enhancing the productivity. The group interaction also helps in fostering creativity, because a change in the routine is often necessary to prevent a man getting stale or losing his enthusiasm. If an atmosphere of shared commitment to a common objective can be created, everyone associated in the project may feel sufficiently secure to shift his attitude as the occasion requires. Each will feel more responsible to be both creative and critical in the interests of the common goal. The fruits of interdisciplinary approach to problem solving are too many to warrant specific mention. Incidentally, such an approach inculcates a team spirit and sense of belonging to the organization. Further, the chances of commercialization of the results of research are vastly improved, because before the project is initiated the techno-economic, scientific and commercial feasibilities are thoroughly examined. Lack of interdisciplinary approach has resulted in a good number of projects and processes which have been completed in the laboratory remaining unutilized by industry. Interdisciplinary and integrated approach provides for constant evaluation of the programme of work and above all the research management is fully apprised of the stage at which the work should be abandoned. However, much headway has not been made in this direction because of the general lethargy to team work and the wall of secrecy at present surrounding scientific research in India.

Environmental system and delegation of authority: Under a scientifically organized environmental system, the research management balances the expectations and objectives in its managerial functions to bring about a state of equilibrium in the system. This system is all pervasive and determines the scope of authority, extent of direction, levels of participation, areas of integration, job content, job relationships and job evaluation, mutual relationship amongst subordinates, superiors and associates. The environmental conditions should be such as to stimulate an honest desire and commitment to creativity, and create tolerance for dissent, non-conformity and mistakes. Creativity takes time and perseverance and therefore it needs firm, continuing objectives, and explicit communication of these objectives. It is important that the goals are sufficiently broad based and flexible enough to provide challenging situations. However, the objectives should not be so broad as to become illusory because it will be difficult to obtain total commitment from creative scientists for

nonchallenging tasks. Increased familiarity in a field at times decreases problem sensitivity, and one solution would be to expose scientists to situations which challenge his creative capacity.

Delegation of authority envisages freedom to operate for people in a predefined area without interference and they are encouraged to exhibit their skill and initiative. People are important, but energetic people with freedom to work are more positive assets. Research prospers most when creative scientists have freedom to select problems and choose also the methods for their solution. When one is entrusted with responsibility, something happens to that person. His productivity increases and the challenge which at one time could have been beyond his reach becomes something capable of achievement. Responsibility makes a person to bring forth extra effort to ensure success of the task. A scientific delegation of authority presages elimination of rigid isolated pockets of control and disciplinary restrictions and introduction of the principles of management by exception.

Communication system: A common feature is that highly educated and talented scientists are more loyal to their profession than to the institution and attach great value to approbation from their professional colleagues than to the opinion of their institutional superiors. A sustained effort has to be made by the management to secure their loyalty and for creating mutual confidence. In this connection an effective communication programme has a vital role to play in interpreting and explaining to the research workers the management policies in respect of various issues concerning themselves, their work, their future, their prospects and a variety of other matters about the institution, its functions, aims and objectives from the point of view of the community at large. A wide acceptance of management policies and programmes can thereby be achieved. Scientists have to be convinced of the purpose of their organization and of the purpose of their individual efforts.

Leadership: The basic attributes of leadership are: judgement, imagination, personnel development, initiative, knowledge, language and tact. These are indeed self-explanatory and their principal characteristics include the ability to infuse others to give out their best; the ability to make sound decisions; the ability to recognize fruitful contributions and to assign credit where it is due; the ability to guide, interpret and disseminate policies, programmes and organizational objectives; the ability to coordinate the group activities and integrate them towards the desired goals; the ability to take full responsibility for failures; and above all the ability to project uncompromising respect for the

creative efforts of one's colleagues and thereby help the organization to solve new and unfamiliar problems. A good leader provides variety and dynamism and guards against the creepage of dull routine which makes individuals resistant to change. He is a moulder of human material and creates an environment which breeds new leadership. The productivity of the research team mainly depends on the potentiality of its leader. By temperament and experience the scientists are better qualified to deal with scientific phenomena, but leadership is a different matter. Leading a research team is a unique problem, because the average ability of the members of the team does not differ considerably. Management's policies for enhancing the creative capabilities of the institution should bestow special attention to this aspect of the problem, because "the characteristics of good leadership are infrequently found combined in one individual and as they are inborn personal qualities, they cannot be imparted through education".[6]

Standards of performance and rewards: The question of setting standards in a scientific research institution need not pose much difficulty. Once a project is identified and a plan of action formulated for its solution, actual performance can be measured against preset activity targets. As the problem and the method of solution would have been predefined, the area of variation in the results to be achieved could be considerably reduced. Unlike research in social sciences, chemical and technological research can be amenable to rational, predictive reasoning of the actual results. Programme Evaluation and Review Technique (PERT) could be profitably used for assessing actual step-by-step performance with activity levels fixed.

Creative thinking and action play a significant role in effecting economy and efficiency and achieving productive results in the solution of research problems. It is in this connection that the question of rewarding initiative and creative thinking arises which needs careful consideration. The error of judging personnel on a long term basis and classifying them as good, bad or promising should be avoided as far as possible. They should be judged from year to year performance and future development or promotional chances should be given on actual performance achieved during the previous year and potentialities shown for immediate future. The result is that the research scientist is constantly made to think of better performance than being content that he has reached a table of the right size. This approach may also create an urge to achieve something more, achieve something better and achieve something new. Recognition and reward help in increasing the self-confidence of creative individuals and this in itself is important.

[6]A. W. J. Caron, *Progress*, 51, No. 285, 3/1965.

Recognition of one's accomplishments will of course depend upon the nature and importance of the contribution. However, techniques for assessment of performance must be clearly defined and be mutually acceptable. Further recognition and rewards should be closely related in time to the completion of the activity.

Rewarding creative achievements may take various forms resulting in better status, accelerated promotions, career advancement, international recognition, etc., but the most appreciated form is that which fetches tangible financial benefit. In manufacturing enterprises, monetary subventions for creative achievements influencing efficiency, economies and increased productivity have been proved to be very effective. But in a scientific research institution, suitable incentives for creative work can be provided without placing any emphasis on direct cash awards. Financial incentives have not produced any significant creative work; rather it has been found to encourage selection of easy projects with quick monetary return to the investigator or adoption of shortcuts in preference to systematic investigation of basic factors[7].

Transfer of technology: The problems of commercialization of research results are too many to enumerate and it is beyond the scope of this paper. However, it may be noted that ultimate utilization of research efforts certainly helps in building up the morale of the researchers. No amount of skillful direction could sustain the enthusiasm if time and again successfully completed research projects are not developed for commercial use. The provision of a mechanism whereby the scientists are assured of the offtake of their ideas would help in increasing productivity. If the fruits of research are not utilized to the benefit of the society, there is waste of scarce resources, and what is more significant, the scientist feels frustrated. When a process is exploited by the industry, the psychological satisfaction which accrues to the scientist far outweighs even personal monetary gains. Any institution committed to creative research can ill-afford to ignore this aspect, and provision of an appropriate mechanism by which smooth transfer of technology is effected will certainly accelerate further creative effort on the part of the scientists.

General

Some other forms of incentives for encouraging creative work by a scientist are : (*a*) freedom to publish research results and thereby secure recognition in the scientific and technical community;

[7] J. V. Rajan and S. K. Subramanian, *Research Management, 11*, 389 (1968).

(*b*) encouraging participation in scientific gatherings and seminars which will stimulate the scientists interest and widen his knowledge; (*c*) freedom to a limited extent, to pursue research in the area of his choice although it may not coincide with the objectives of the organization; (*d*) providing a competitive or even a moderately hostile atmosphere; (*e*) locating the institution near a university, (*f*) providing educational and recreational facilities for the scientist's family.

Institutional deadwoods: Probably the most common method of stifling creativity is to assign creative people to routine repetitive tasks. Years of routinized work often makes a person develop a set pattern of mind and minor phobias, when he ceases to be useful to the organization. He shuns dynamism and new ideas and finds a fanatic pleasure in the routine. Such deadwoods are numerous in any organization and a government research institution is an ideal ground for breeding this species. They become resistant to change, because it is not laid down in the rules. The attitude becomes one of "what was good hitherto can as well be good hereafter". Unless he gets rid of his penchant for routine, no creative ideas can emanate from him or from his associates.

Factors hindering creativity: So far the discussions related to the requirements of ideal job conditions for creative research. However, there are certain negative factors and attitudes which creep in unconsciously in any organization, and in a research institution these phenomena are most common. They act as disincentives to creative work and research management should take care to see that these factors are weeded out. Beveridge observed: "Variety stimulates freshness of outlook, where too constant study of a narrow field predisposes to dullness. Therefore reading ought not to be confined to the problem under investigation, nor even to one's own field of science."[7] There are two principal types of research workers—the factual and the creative. The former believe in what is known and understood, while the latter are more interested in the unknown or the "ununderstood". The so-called "experts" belong to the factualists school of thought and they specialize intensively in a narrow field. They can inhibit creativity of others by destructive criticism. Another fairly common attitude is the functional 'appartheism'. It is not often realized that every function is equally important and interdependent. For instance in a manufacturing unit, there is nothing like sales function being superior to production or administration being inferior to distribution function or *vice versa.* In a research institution this realization at all levels of management

[7] W. I. B. Beveridge, *The Art of Scientific Investigation*, London, Heinemaun Ltd., 1950.

is all the more important. However, in our country it has become a fashion to bring in the invidious distinction between research and service functions and even in research there is a tendency to consider basic research being more intellectual than applied research. For this reason wage differentials and promotional chances closely follow this distinction and it is conveniently forgotton that such differentiations between groups or functions should not only be fair, but they must be *seen* to be fair and logical. The other negative factors which affect more directly the individual's creative ability are: (*a*) his superiors may not do their best that they are capable of; (*b*) the personal behaviour of his senior colleagues may be an affront to his dignity and self-respect; (*c*) his superiors do not believe in any progressive measures, such as management by exception, scientific delegation of authority and responsibility; (*d*) there is a tendency to undermine his morale in various ways, including in particular ignoring him in favour of the juniors without any systematic allocation of work; and finally (*e*) professional isolationism for reasons which are peculiar to India or in any case more serious in our country than in others, *viz.*, that an individual hails from a different State, speaks a different languages, or belongs to a different caste, community, or religion than those with whom he is associated or those who decide his career prospects.

Reference needs to be made to the system of "projectitis", which is common in our country. This means very detailed outlining of the research objectives and procedures for the consideration of the various controlling committees and boards for getting financial sanctions. Thus, the research effort is reduced to one of the pampering the committees' views and fancies and the unusual 'puzzlement' which has led to significant discoveries is discouraged. The research worker becomes, in this process, a mere technician. Under-utilization of high-calibre personnel is the surest way of dampening enthusiasm.

Conclusion

The foregoing discussions bring out the close relationship between creativity and job incentives. We are aware that a majority of the points discussed border on abstract generalizations and a critic may as well term them as pious platitudes, but in a topic of this nature generalizations are inevitable. Though certain important incentives have been identified, they can vary according to circumstances. A deep study and classification of the deeply-felt and weakly-felt needs will help in finding suitable incentives for improving creativity. Thus, creativity in research stems out of the right person and incentives help bring out his enthusiasm and maintain it. An incentive plan which

aims at improving creativity has to take into account various factors and has to be closely interrelated to the institutional objectives. The research director can greatly help in sustaining the enthusiasm of the research workers by meeting them individually on a personal basis as often as possible for informal chats to acquaint himself of the progress and the problems faced. Usually knowledge gained through these chats becomes very valuable, because professional scientists do not normally wish to argue with their official superiors at formal meetings. In research, it is essential for the scientists to feel that they are working *with* a person and not *for* him. The art of 'suggestion' carries more weight than 'commands'. The attitude of 'we' and 'our goal' brings out the best in them.

A certain amount of disagreement is to be expected in a research institution which has under its roof intelligent and enthusiastic professionals. Variations in personality, ability, and interest must be accommodated. Cooperation could be spontaneous, provided they are made aware of the basic reasons and factors involved in decisions affecting them.

Tact and a positive approach can be very valuable. It is always easy to kill a new idea. There are inevitably many reasons why it might not work, but to give it a fair examination calls for the painful discipline of thought. At times small expenditures may be allowed for maintaining the enthusiasm of the researcher though the idea may not be very fruitful, but a blunt 'no' kills his enthusiasm. Experience has shown that frequent stimulation and encouragement by supervisor contribute significantly to the development of high research competence and performance.

Again, even competent scientific personnel may at times be engaged for a long period in a project which is either not successful or has to be stopped due to changed circumstances. Here also, when a project is stopped, some provision could be made to enable the scientist pursue his idea in a modest way until he is clearly proved wrong. This is necessary to keep up the morale of the scientist and prevent his being overwhelmed by a sense of utter frustration.

ENVIRONMENTAL FACTORS IN THE CREATIVITY OF SCIENTISTS

Shib K. Mitra

CREATIVITY has been studied as talent or giftedness since Galton who, more than anybody else, gave it the conceptual status of a characteristic or trait. It has remained so in the large number of studies that suddenly came upon the American scene in the fifties of this century. Like many other human characteristics, creativity is considered to be a joint product of heredity and environment. Galton had looked into the heredity aspect. Terman in his classic studies, had enquired into both heredity and environment. But environment, in the literature on this subject, means generally the past home and social background in which the creative individual was brought up. One rarely comes across studies on the influence of the present environment.

Lehman's classic study on age and creativity in science in which he showed that creativity increases gradually with age, reaching its peak around 35-40 years and declining thereafter, influenced a number of similar studies relating creativity to sex, social class, occupation, etc. While these studies help us to see how creativity in science is related specifically to certain aspects of modern society and personality, they do not increase our understanding of the precise nature of the influence of society on creativity in any meaningful way so that one could take recourse to social engineering for furthering creativity. Anecdotal studies of scientists as well as autobiographies have been analysed without much success to arrive at certain general relationships binding creativity to environmental factors. It is difficult to generalise from the finding that creative scientists have come generally from the middle class. Is it a spurious relationship? Is it a reflection on the present social order? Is there something in the middle class values rather than the economic features which really lead to creativity? One could ask many such questions. Similarly with regard to age, one finds that motivation for science tends to increase among scientists from a very young age up to around 35-40 years after which it begins to decline, not because of age, but because of the rise of other motives which in their turn grow out of situations of responsibility in which scientists are placed. One also finds that in spite of age beyond forty

some scientists tend to remain creative along with an increasing motivation for science. In other words, motivation for science is somewhat independent of age and is crucial to creative production.

If one asks: what is it that makes a scientist *creative*, as distinguished from *productive*, one may get an answer somewhat along the following lines. First of all there must be a genetic component which lays the basis for further development of those mental processes which enter into a creative scientific act. This component should be nurtured in the early years at home by parents either directly by positive guidance and training or indirectly by providing for an enriched environment which gives scope to a child to develop its potential creative powers. Later, the school should provide learning experiences to enrich his knowledge and develop his skills and ability to identify and solve problems. Sometimes a distinction is drawn between two types of creative scientist, *viz.*, the problem-identifier and the problem-solver. With the rise in computer technology one may even hope that problem-solving will be taken over by the computer some day. But science will always need man to identify problems as worthy of attention of the best minds. However, this distinction is relevant here only because our school curriculum emphasises problem-solving. Studies in the development of intelligence and abilities show that the early years of childhood up to about eleven years are crucial, because the curve of development is accelerated sharply during these years. Bloom claims, on the basis of his analysis of numerous studies, that the influence of environment, in the matter of rate of development of intellectual powers, goes down as the age increases and, therefore, if the school can do anything at all in developing the potentialities of a creative scientist, it will have to be in the pre-primary and the primary school. Considering the poverty of the masses in our country, I will rule out the influence of home whether it is economic, social or cultural. The school, and particularly the pre-school and the primary school, in our country should not only provide an enriched curriculum for those children—and they are in majority—who come from the backward sections of the population to overcome the lack of positive help from home, but should also provide learning experiences in a planned manner in order to develop the abilities and skills involved in identifying problems. We are losing a large potential reservoir of talent in the country by neglecting pre-primary and primary education. The few creative scientists that we get are in spite of the handicap in school, and are really freaks of nature. A modern society, however, cannot hope to survive, not to speak of advancement, if it does not ensure an increasing supply of creative scientists, which obviously cannot be done if we depend on freaks.

The potentially creative scientist requires knowledge and he gets it in the secondary school, college and university. Here, again, it is important to provide an environment which allows many tracks to follow. The creative individual is not a plodder whereas our entire school and college arrangements are for the plodder. There is a syllabus, a time table, prescribed books and, to cap it all, a public examination—all of which instead of providing only a general framework within which one can operate with considerable freedom crams all initiative, enterprise, and deviation, almost like the single track railway system. There is, of course, the problem whether such a large school system as ours, dependent on public funds, can be geared to the production of a few talented individuals. An environment which stimulates the talented may not do anything to the ordinary. But if the pre-primary and primary schools are developed on the lines suggested earlier, the chances of a stimulating environment having negative effects on learning at the secondary and higher education stages are minimised. In education we have neglected challenging the young minds. Doping is not just in the market place; it has permeated the academic sanctuaries. Motivationally, Toynbee, the famous historian, has suggested that history is made by nations in response to challenge. This is true of learning in schools and colleges. The talented child, whether it is a Tagore, Ramanujam or Wiener, rejects the drab dull world of learning in schools and colleges. He becomes a lonely individual seeking a corner, a secluded spot, to pursue his thoughts with the help of books which are not prescribed in the syllabus. He wants to advance at his own pace and not goose-step with the class. Studies have identified this individualism or 'deviantness', bordering on the abnormal, of the talented scientist. It is the environment which produces such reaction, and it is adaptive, for it helps the individual to be creative. It is doubtful whether one will find this individualism or deviation as a trait, if the schools and colleges of tomorrow change in the direction of providing for individualised rates and goals of learning.

One point needs to be mentioned in this context. Nothing is more challenging to the young mind of a talented student as being exposed to brilliant and creative minds. It is not only challenging, it is perhaps necessary in science that the young pupils learn under a master who is himself talented. A study of nobel prize winners in physics shows that there is almost a genealogical tree of professors and students. The nobel prize winner 'begets' another, if he has a potentially creative mind under his care as a student. How this happens one does not know. There is challenge, stimulation, guidance and direction. But not everybody can take it with advantage. Nor is it freely given to everybody. Sometimes, and only sometimes, the mind of the teacher-

scientist clicks with that of the student. When this happens, there is a spark. A rare event, but nonetheless worth pursuing, for the returns from such an event may be tremendous.

Finally, one comes to the question of the contemporary environment of the creative scientist. What is necessary in the organizational milieu where the scientist works to help creativity? The answer to this question cannot be found in the literature. The scientists are found today in the university, in governmental institutions and the private enterprises. The managerial climate, the organizational structure, the administrative rules and regulations are different in these three types of organizations. But we know certain things about motivation for work in general which may be relevant. One important thing to provide is incentive. In the case of the scientist, recognition of his work in scientific circles is the desideratum. But he needs recognition in the organization as well. This is not easy for any organization, particularly not for governmental organization bound by bureaucratic rules and practices. How to give recognition to a scientist for his creative work which will instigate him to further research efforts and should not lead to a permanent settlement in a cushy organizational position for ever is a problem. Monetary incentive should not be ruled out, although there is a cultural image of chill penury being very ennobling for the traditional seeker after truth, the brahmin in our culture.

The creative scientist needs to have a work situation where he has an area of freedom to operate, *i.e.*, where he can choose his specific problem of work. In non-university set-up, there will usually be a hierarchy and the scientist has to operate within this institutional arrangement. Autonomy in the sense described above is frequently in jeopardy in a bureaucratic hierarchy and special care has to be taken to keep within limits the supervisory packing order in the hierarchy. The real problem is with the creative scientist in such a set-up. It is a problem in management whenever our organization tries to relax rules for an individual, and yet, without this relaxation the creativity is stifled, not only for lack of motivation but also for contrary motivation in which the scientist is willy-nilly forced to find the outlet for his steam. He will need complete support of the top boss in order to shield himself from the corroding anger generated by the restrictive supervision of his immediate superior. The age of the talented scientist is an important factor. Because he is young, he finds himself frequently in our country under an older (who may also be non-talented) scientist. An organization has to break tradition, if it has to create a climate which is oriented to merit. Recently a study showed a large number of things which

are considered frustrating by our scientists. It shows the typical power and control orientation of any large organization for which a bureaucracy develops as an efficient adjustment. But in order to develop organizational efficiency, the individual scientist is put into a non-creative situation. The immediate work environment, including the architecture, must be such as to provide a creative situation. Too long have we thought of creativity as a trait in a scientist which must manifest itself as much as blue eyes or fair complexion do. We must think in term of creative versus non-creative situation, problem-finding versus problem-solving situation. Then it becomes a problem in administration and management where power and control must be so used as to provide autonomy, freedom, stimulation and challenge, to the creative scientists in the organization.

The encouragement of creativity in an organized structure requires the creation of a climate within the organization which seems to go counter to the climate of static stability where there is no room for the unknown, for surprise. To create such a climate, it is necessary to have a group of young creative scientists. I wonder if it is possible to develop a practice in the organization where it should be possible to take out a small group of persons from the main organizational structure for a period of time with the freedom for them to step into the system and go out according to their wish. But without this it is difficult to give the creative scientist the stimulation and challenge from other scientists as well as give him enough protection so that he can take risks in new ventures.

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THE SCIENTIST AS A MANAGER—THE DUAL RESPONSIBILITY OF A LABORATORY DIRECTOR

R. N. Chakravarti

LABORATORY management is more or less a compromise between science and administration and the man at the helm should be well versed in both. It is not the job of an administrator. A scientist of proper eminence is essential but it does not at all mean that an eminent scientist will automatically make a good director. Cases are not wanting where an eminent scientist failed miserably as a director. Although the majority of the problems that a laboratory director has to face are practically of the same type in all the countries. However, in a developing country, conditions are somewhat different in certain respects from those prevailing in the more advanced countries. The unfavourable financial position of this country is naturally reflected in the problems involved in the management of the laboratory. These are further aggravated by the unfavourable situation with regard to the underdeveloped scientific industries of the country as a result of which a good part of the requirements have to be imported. Also because of the scarcity of employment, one tries to stick to his post here even if he does not like the job at all and creates problems for the management. Unlike laboratories in the advanced countries, a very large number of unskilled and semi-skilled staff are invariably employed in laboratories in India, giving rise to certain problems. There is a peculiar sense of dignity of labour prevailing here possibly coming out of our age old caste system. Even a scientist trained in a Western laboratory, succumbs to this system within a short time of his return to this country, smoothly settles down to the local system. And above all security measures provide additional problems of considerable proportion to the management in laboratories here as compared to those in the laboratories of the West.

The organization of research in a laboratory in many cases involves the integration of work in a number if related disciplines or fields of specialization. The director, though placed as the head of the organization, cannot be a specialist in all these fields. It is desirable neither for the director to forget this nor for any of his colleagues to remind him about it. It is, however, vitally important that the director should

be an unquestionable leader in his own field of specialization to have the confidence of those he directs. At the same time he should have sufficient prior experience of collaborative work with scientists in the other related fields, and of frequent joint dicussions in connection with such work involving scientists of different disciplines. It is most important for him to have quite a broad outlook with regard to the work of the laboratory and to understand the correct significance of the points raised by his colleagues.

A successful director maintains proper balance between his two functions—as a research director and as an administrator. In most of the laboratories there is provision for a secretary or an administrative officer. In somewhat larger establishments there is provision even for an accounts officer, a purchase officer and possibly a stores officer. In view of this position, general administration can be a comparatively simple affair for the director. Most of the general administrative items do not come to him at all and he has to attend only to the special ones. Even the few general items that the director has to attend can, with some experience, be sorted out and the simple ones disposed off quickly. Only a few complicated ones may require some consideration and time. For the remaining major part of the administration, the knowledge and experience of the director in science plays an important role, and this part cannot be handled effectively by a member of the usual administrative services.

Objective

The objective of the laboratory should be defined clearly though in a broad way. It is desirable to normally confine the activity within this boundary, but there should be sufficient room for discretion on the part of the director to move a little out of the boundary. In special cases, research in a different field may also be undertaken. For instance, in a drug research laboratory having provision for a micro-analytical service section with a chief analyst and a number of juniors, in case the former is capable of carrying out some research work in micro-analysis after attending to the difficulties in the routine service and managing the affairs of the section, the director may use his discretion in allowing such research work although it is far off from the objective. On the other hand, in a multi-disciplinary laboratory having a specified central objective, one or other of the colleagues may be fascinated to deviate considerably from the objective of the laboratory because of his personal convenience and liking. In such a case, it is the duty of the director to make the position clear to the erring colleague so that team work may not be hampered and work may continue

smoothly within the limits of the objective. It is vitally important to inspire creative spirit amongst all senior and junior scientists, but this does not at all mean moving out of the track. The problem involved in such a case is more serious than that in a football team with a selfish scorer.

Team Work

On the director rests the whole responsibility for maintenance of team spirit in the laboratory. One interested in independent work, or in work outside the scope of the laboratory may find much greater liberty in this respect in a University laboratory where team work is not essential. It is difficult for the type of laboratory under discussion to provide such facilities. Independent research is mainly in the interest, if any, of the individual scientist concerned. If some work is good, it is immaterial to the country whether it is the work of one or more. In view of the interest sometimes shown for independent research during selections, promotions, etc., a young scientist may be tempted to find out ways and means for carrying out independent research. What is more important than independent research is leadership and the emphasis should be on the latter. A single scientist may be able to do something, but if several scientists pool together their efforts better research work is possible and there is better chance for training others.

In the pre-Independence days, most of the Indian Universities provided for D.Sc., available only through independent research. After Independence, provision has been made at many Indian Universities for Ph.D./D.Phil. also. Further, the number of Universities has increased enormously. There is a huge demand for having junior research jobs and fellowships as a means for acquiring these higher degrees. In most other countries such degrees may be acquired while working in a University laboratory as a regular student of the University. On the other hand, in this country the aspirant may try for the degree while working on an assignment in an outside laboratory. It is even possible for one employed in a whole-time job elsewhere to try for the degree by working outside office hours in a laboratory. Also a number of organizations are offering a large number of research fellowships. If a few such aspirants for the doctorate degree work in a laboratory it does not matter much, but normally facilities for post-graduate work should be the responsibility of the Universities as in other countries. While the objective of most laboratories covers an applied field, sometimes it becomes necessary to deviate from this field to meet the needs of these aspirants for doctoral degrees. In

all such matters, it is necessary for the director to maintain proper balance.

Research Programme

To chalk out the programme of research is perhaps the toughest job of the director. Unlike a newly started laboratory or a laboratory which has earned goodwill after successful running for a considerable period, the position is much more difficult in a laboratory which is not moving along the normal track. To orient the research programme along the right lines, it is essential for the director to take all appropriate steps. In the preparation of the research programme it is important to take into account not merely the objective of the laboratory, but also the funds and other facilities available, specially the available scientists. It is necessary to take note of the level of their competence and their research interests within the field of work of the laboratory. If the programme is drawn up in the proper way, the work usually proceeds smoothly. In formulating the research programme it is desirable to relate it to the actual needs of the country. It is also necessary to complete each project within a reasonable time, so that some other prospective project may be taken up in its place. Sometimes an enthusiastic scientist becomes so deeply engrossed in an old project that he is unwilling to give it up even though the investigation has become too "stale" and no longer suitable for yielding any useful result in the conceivable future. In such a case, it is for the director to take the decision to close the project and to break the news to the concerned staff member. It may be unpalatable to the scientist, but later on becoming engaged in more profitable work he would like it. It is also important to explore possibilities for fruitful collaboration with sister organizations, as found desirable.

It is certainly not desirable to avoid duplication as a general principle. Confirmation of results by other groups of workers is an essential requirement in science. Of course, duplication in costly projects of a major character should be avoided in the absence of proper justification. Unusual haste in reaching conclusions is also not desirable, specially when it is a medical problem. There cannot be a better evidence for the importance of both these matters in research when one considers the birth of the thalidomide babies. It is certainly not desirable to plunge into this kind of misery on the basis of such hasty and unconfirmed research. Unfortunately, many critics of scientific research in India do not seem to appreciate the importance of these factors.

Staff

Full cooperation of staff is essential in the running of a laboratory.

In this respect the major responsibility lies with the director. Most of the staff are of the normal type and it is only in a few instances that some deviation from the normal occurs. All such cases require very tactful handling for ensuring smooth and satisfactory progress of work in the laboratory. It is remarkable that some of the troublesome scientists of the younger group are professionally sound and show great promise with regard to capability in research. In view of this, such cases require careful consideration in the overall interest. Though discipline is of primary importance in laboratories involving team work, it would be quite unwholesome to have a collection of very docile scientists around the director. Most of the troubles arise out of misunderstanding of one kind or the other and hence the underlying causes of such troubles need proper analysis. There are numerous instances where rising, young scientists develop serious difficulties in relations with their seniors—this is nothing unusual in youth, and yet in later life they become closest friends of the same seniors. Clarification of the misunderstanding in most instances may pacify a revolting scientist. Although a scientist may become a victim of dogma rather easily, a true scientist responds to reason. Difficulties arising between a senior and a junior are usually less troublesome than those arising between scientists of the same status. But the remedy is more or less the same in both the cases. In the latter group of cases also it is imperative for the director to step in and clarify any misunderstanding which may have developed.

A Plea for Science Cadre

It is not at all essential for a director to choose his scientists. He will have no special advantage in doing so, provided that the scientists selected otherwise are fully qualified for the work. Personal likes and dislikes should not influence the selection of personnel for a laboratory. It would be quite advantageous if the scientists are selected through a central selection body. The director may send his requirements to this central agency. A more advantageous system would be to have an Indian cadre of scientists. Such a cadre would help remove the most of the difficulties that are arising today in the administration of the laboratories. Few will deny today that science has a fundamental role to play in the development of our country. It is, therefore, essential to utilize to the optimum all the scientists working in laboratories and other scientific research institutions. Amongst the various types of work the scientists are required to do, *e.g.*, teaching, routine analytical, routine production, research, laboratory administration, etc., research offers the safest corner for under-activity and even inactivity. Sometimes a scientist finds it difficult to pull on with the authorities or

becomes unproductive and loses interest in the type of work entrusted to him. Also, one appointed in an institute for applied research may get interested in pure research with no direct prospect for utilization. It is important to safeguard the interest of scientists from the personal likes and dislikes of the boss—not merely the scientists close to the director in rank but also the very junior scientists under them.

There may be a single cadre of scientists for the whole country or a central cadre and separate cadres for the States. It serves no useful purpose to compel a scientist to do a job which is not to his liking. The setting up of a cadre would help in proper placement of scientists—matching their research interests with the job requirements. Under the cadre sysem, a less active or disinterested scientist would have the opportunity to become more active or interested in work by a transfer to a changed environment. One lacking in proper initiative for research or losing interest in research could be shifted to a suitable post for routine work. Similarly, one who prefers pure research though posted in a laboratory for applied research would be able to change over to a University job, requiring both teaching and pure research. The present system of selection of scientists for particular posts is expensive and time-consuming. In a properly organized and managed cadre system, the selection process will be streamlined and even, perhaps, more objective. It will also be possible to rectify a wrong placement by transfer to a suitable post. Keeping a troublesome scientist idle is neither in the interest of the country nor of the laboratories. It would be desirable to salvage even a seriously erring scientist. Moreover, there should be maximum protection available to a young budding scientist. Generally, scientists next in rank to the director are usually experienced enough to take care of themselves, but the young juniors under them may not be so. The director has a special responsibility in this respect as such juniors are the hope for the future.

Staff Meetings and Seminars

Regular staff meetings to discuss the progress of work can be very useful in promoting team work. There may be a general discussion about the overall position and detailed discussion about some specific items. Difficulties and problems arising in day-to-day activity may also be considered at such meetings. When a project has been completed, its report may be placed before a seminar, preferably by a junior scientist who would thus be able to acquire the necessary training in presentation of findings before a professional gathering and in answering questions. The general discussion that would follow would be quite

profitable for further progress in the subject. It is desirable for the director to encourage the scientists to take part in symposia, etc., organized by various recognized bodies. Once in a while a symposium or a group discussion may be arranged in the laboratory itself by the director to which outside scientists may also be invited. This would help broaden the outlook of the laboratory and useful, new lines of research may develop from such discussions.

Annual Report, Publications, Patent, and Royalty

Every laboratory should publish an annual report covering a brief account of the work carried out during the year and circulate the same to other related laboratories. The report may, besides research, include matters like staff position, symposia and other activities, etc. As regards publication of papers, it is important for the director to see that these are properly balanced and do not include overclaims, premature claims or unfounded claims. It is also important to see that there is no serious injustice done to any of the staff by exclusion of the name of an actual contributor. As the good name of the laboratory depends considerably on these papers, it is necessary for the director to maintain a uniform standard of presentation and in this matter he may have help from a small committee of experienced staff. Legal matters are involved in patents, release of processes to industries and royalties for such processes, and as such these matters should be handled in consultation with related experts. Sometimes a junior complains that his senior is quite unreasonably insisting on inclusion of his name in a paper. It is also not unusual for a senior to complain that his junior has published a joint work independently. More serious trouble may arise in the distribution of royalties. Inclusion of one in a paper which does not incorporate any of his results may not always be so unjustified as exclusion of one who has actually worked out some of the results incorporated in the paper. Even in the old days famous scientists often included in papers names of workers who could not achieve any positive results. For instance, if two are working under a guide on two approaches for solution of the same problem and if one leads to positive result and the other is unsuccessful, it is not always unreasonable to include both the workers in the paper covering the successful result only. It is difficult to set up fixed rules for controlling such matters and some amount of discretion is necessary. In the case of a director commanding proper respect from his staff with regard to sense of justice, problems arising in such matters can be settled smoothly and amicably, but the main principle in resolving them has to be that a senior must show proper consideration to his junior even if it means giving up a little of his own self-interest in favour of the latter.

Library, Documentation, Information, and Workshop

A good library is a "must" for a good laboratory. Keeping in view the budgetary position, the best utilization of the available funds is desirable in procuring as many of the required books and journals as possible. Suggestions may be obtained from the senior staff, but the director's personal interest and care is essential. Properly trained staff for documentation is very helpful for the scientists and particularly for the director. In addition to carrying out the work of the laboratory according to its declared objectives, it may serve a useful purpose to supply to other laboratories, individual scientists and the related industries, the information they need in the fields of specialisation of the laboratory. Even if there is provision for special officers to look after this matter, it is desirable for the director to look up at least the more important or complicated cases. For instance, information on results of research may or may not be supplied to outside parties before publication, as found desirable by the director. A good workshop is also an essential service section for a modern laboratory. In addition to the repairs of equipment, etc., a workshop is useful in inspiring the young enthusiastic scientists in designing original devices for laboratory work.

Expansion

Although expansion cannot be a regular feature for a laboratory, along with expansion of scientific activities in the country this is more or less an inevitable item for the directors to handle at the present moment. Such expansions, if planned in the proper way, may be of considerable help for proper growth of the laboratory. But whether during planning or during execution of the plan, all items should be critically considered including overall economy and scope for proper utilisation.

Assessment, Promotion, Training, and Retirement

Proper assessment of a scientist requires considerable competency and care. It is also necessary for the director to be properly conscientious. Personal likes and dislikes should not at all play any part and the director should be able to present a clear opinion about he capability and contribution of each individual scientist under him. f promotion becomes a routine affair, it would lose its charm as an ncentive for better research and in inspiring creativity in a growing cientist. It is important for the director to spot the lacunae in nowledge and experience of the various scientists under him with egard to the work involved, and whenever necessary and possible he nay arrange for the required training by sending them to the appropriate

laboratory in the country and if required even abroad. Retirement of scientists should follow a set pattern save in very exceptional cases.

Security, Cleanliness, and Accidents

Security is an important item in Indian laboratories specially in the big cities. While I was at the Converse Memorial Laboratory, Harvard University, I was provided with the keys of the main gate of the building, my room and the library. I had never any difficulty in opening up the library at night, while the usual library staff were off duty, and read quietly up to late hours. On numerous occasions I acted according to the instruction hung up there—"if you take out any book from the library at night, please return it tomorrow by 9 a.m." Of course, it does not mean a laxity in the administration there. This may be evident from the following incident that took place in 1947 between President J. B. Conant of Harvard University and Jack Grecko, the only sweeper of the big building. As I was an early goer to the laboratory, I developed some friendship with him, and learnt about the incident from him. Short-statured, simple, ex-army man Jack was scrubbing the floor in front of the library with his brush when a tall man came and asked him to open the door of the library. He immediately raised up his head and questioned him, "who are you?" The reply was also a simple one, "I am Conant". As far as I understood from Jack he could not express his regret right at that moment before Conant, but deeply regretted before me immediately after that for not recognising the President of Harvard University. I had to assure him repeatedly that Conant would all the more like him for his devotion to duty. Whenever I have analysed this incident I have noticed that Conant though President of the University at that period, was essentially a famous chemist and as such it was natural for him to come to the Converse Library to read even when it was not officially open in the morning. But he had to face the question from the sweeper Jack "who are you?" On the other hand, I had the key of the library to open it whenever I liked. It is very much helpful for the senior scientists to possess a key of the library so that they may open the library and read at any time and even take out books and journals for night study, but under the prevailing conditions it is not possible to put this into practice in our country. So also is the position with regard to several other things of the laboratory. And the position is not at all moving towards the better. In view of this position, the general security of the laboratory is an item of considerable headache. In the case of a well-managed laboratory it is not difficult to fix the responsibility for any serious loss or damage. But obviously this requires considerable amount of administrative staff and the set-up of an Indian laboratory differs considerably from the set-up

of a Western laboratory. The problem becomes more and more complicated as more and more of non-scientific staff are employed.

It is also necessary to take all precautionary measures for avoiding accidents and also to have some provision for meeting any emergency caused by an accident. Fires are not uncommon in laboratories. Any minor fire in a laboratory, if not handled in the proper way, may lead to a major fire. During my stay at the Dyson Perrins Laboratory, Oxford, under Sir Robert Robinson, the then President of the Royal Society, there was a fire in 1946 on a Saturday evening while nobody was there. The fire was stopped by entering through a window by the late Sir Shanti Swarup Bhatnagar who was there to attend the Royal Society Empire Scientific Conference and was having a stroll along South Parks Road. Some months later about mid-day a serious fire broke out in the store room. Sir Robert struggled with the fire like a brave captain with Lady Robinson supplying the fire extinguishers. We could only supply some of those to Lady Robinson.

Thus safety measures also require personal consideration of the director. Employment of a large number of non-scientific staff is an additional source of hazard in addition to the beginners in scientific career. There are also a few chronically careless scientists. And above all, there are the genuine accidental accidents. There cannot be any question of excuse for the director. It is necessary for him to take all possible measures against all such hazards as far as practicable. The director's round is a must not only for having proper acquaintance with the workers but also for looking after general cleanliness and for checking clumsy and undesirable movements in any part of the laboratory.

Budget

The director has to be considerate with regard to the financial position of the country and it is essential for him to take all possible measures for avoiding wastage. Most of the instruments and equipment suitable for use by a number of scientists should be maintained properly in a central place so that it may not be necessary to procure a number of instruments of one kind. The research programme may be so drawn up and the work conducted in such a way that the expenditure may not go beyond the budget limit. For this, it is necessary to scrutinise the indents from the beginning of the year so that there may not be any difficulty in having essential supplies even towards the end of the year. While indenting for costly instruments, it is necessary to find out properly the actual needs. So also the requirement of staff

should be reasonable. Preparation of the budget estimate requires considerable experience as the requirements are to be assessed sufficiently in advance with regard to all the items of expenditure and presented before the authorities for sanction.

The procedure for purchase is very much complicated as compared to the position prevailing in the advanced countries. It would be very much convenient if most of the items are available through Governmental agencies or from recognised establishments so that the required items may be available at properly notified prices without the need for asking for quotations.

Controlling Bodies

The director as an intermediary between the laboratory and the staff, on the one hand, and the controlling body of the laboratory, on the other, is required to satisfy both sides. Sometimes this becomes rather difficult. A large volume of work of a serious nature is involved in managing the affairs of such bodies.

Director's Research

Sometimes it is heard that a particular director is not carrying out solution of any research problem of his own. Such questions are seldom heard of in the progressive countries. After all his main duty is to run the team and develop the laboratory. It is not unusual for a good player to somewhat lose his previous form when appointed as the captain of the team. On the other hand, young brilliant scientists have sometimes failed miserably as directors in view of their keen interest for their personal contribution in research. A good director helps the growth of a number of brilliant scientists, but the same may not be true with a director who wants to flourish himself as a brilliant scientist. In very big organisations the director gets very little time for actual research work, in a medium-size laboratory the director may have some time for research, whereas in comparatively small laboratories he may have sufficient time for serious research. However, if the director comes from the stock of established scientists, it is natural that due to his long acquired habit he would prefer to spend a substantial part of his time in actual research. It may also be pointed out that it is easier for the director to inspire other workers by carrying out research work himself after taking due care of all his other functions.

In fact, the overall function of a director is more or less the same as that of the captain of a ship on the high seas proceeding towards her

destination. The sign of smooth management is evident when each one performs his duty smoothly, so much so that the next in command may be tempted to think that the director is not necessary and so also all others in the different steps may individually think that he is essential for the work and not his senior.

ORGANIZATION STRUCTURE AND ADMINISTRATIVE PRACTICES IN SCIENTIFIC INSTITUTIONS IN DEVELOPING COUNTRIES

Kamla Chowdhry

IMITATION OR INNOVATION

THERE is a widespread tendency in India and other developing coun tries to imitate practices of the West not only in the introductioı of science and technology, but also in adopting organization structure and administrative practices. Many of our institutions of higher learn ing and scientific research are based on British or American 'models and the borrowing seems to be done without sufficient understandin of the social and cultural factors influencing organized behavioui Recently, scholars in organization and development theory have indi cated the dysfunctional aspects of imitating organizational practice from the West to developmental problems in the developing countrie: Thus, William Foote Whyte[1], who has worked extensively in Per mentions:

> "Imitation fails to pay off because the value of an institution de pends in part upon the context of the culture and the social struc ture of the society in which it is found. The institutional structur and pattern of activities that work well in the culture and socia structure of the U.S. may not function at all well in the quit different culture and social structure of Peru."

Similarly, Thompson[2] in a recent paper on development ad ministration observed:

> "Administrative practices and principles of the West are derive from preoccupation with control and therefore have little valu for development administration in underdeveloped countries wher the need is for an adaptive administration, one that can incorporat constant change."

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[1] William Foote Whyte, "Imitation or Innovation : Reflections on the Institution Development of Peru", *Administrative Science Quarterly*, December 1968, p. 372.

[2] Victor A. Thompson, "Administrative Objectives for Development Administration *Administrative Science Quarterly*, June 1964, p. 479.

Careful analysis of the habits and practices of a people shows that the behaviour practised between parents and children, for example, is systematically related to practices which obtain between teachers and students, and between superior and subordinates. This systematic or patterned quality of culture is a function of the integrated character of human beings. Therefore, the introduction of organizational practices, which are at variance to the integrated experiences of individuals as they grow up in their society, is likely to create conflicts and alienation, and consequently can be self-defeating.

Japan, a recent arrival among the highly industrialized countries, has copied and imitated technological advancements from the West. Yet the organizational practices that bind people together to produce coordinated effort, the recruitment system, the salary structure, are all at variance with the organizational theories and practices of the West[3]. As someone so insightfully stated that Japan has gone against all the rules in the books and yet has emerged successfully. Russia is another such example.

Science and technology has no national and cultural boundaries, but the scientists who make science and technology work are influenced by their cultural norms and values. An innovative rather than an imitative approach which will help determine organizational practices which are congruent with science and technology on the one hand, and with the experiences of individuals as they grow up in their society on the other hand.

There are other factors why imitation results in inappropriate structures and practices. In the more developed countries, there are many scientists in many different types of scientific institutions. There s a high degree of specialization and mobility so that scientists with different types of skills and experiences are easily available. In India, on the other hand, the number of available scientists are limited so that he approach to institution building has to be different. Thus, Bhabha[4] n discussing the Council of Scientific and Industrial Research CSIR) laboratories mentioned:

> "While this method (referring to a fixed organization structure) of setting up a laboratory might give reasonably satisfactory results in a developed country in which science is already an important

[3] See Kamla Chowdhry, *Selection and Training Procedures in Japanese Industry*, hmedabad, Ahmedabad Textile Industry's Research Association, 1957.

[4] H. J. Bhabha, *Science and Problems of Development*, Bombay, Hind Kitab Press, 66.

activity and a large number of scientists already exist in the universities and in other public and private laboratories and research institutes, it has serious disadvantages in a country in which organized science is still in its infancy and the number of available outstanding scientists limited."

In the last two decades many scientific institutions were started with varying degrees of success. It is hoped that case studies of "successful" institutions will help increase the body of knowledge available to policy makers and administrators concerned with establishing and building viable scientific institutions.

CASE STUDIES OF SCIENTIFIC INSTITUTIONS

Case studies of two "successful" scientific institutions were undertaken in order to understand the institution building process in India. These two case studies, of the Atomic Energy Commission (AEC)[5] and of the Ahmedabad Textile Industry's Research Association (ATIRA)[6] have already been published. Some tentative conclusions that emerged from these two case studies have been summarized below.

The Governing Council

In the initial stages, the Atomic Energy Commission (AEC) consisted of three members, all scientists of eminence and distinction, all concerned with building scientific institutions in India. Besides, the Chairman of the Commission, the other two members were the Director-General of the Council of Scientific and Industrial Research and the Director of the National Physical Laboratory. Later, two non-scientists were added, a member for finance, and an industrialist (Mr. J. R. D. Tata) who was a great institution builder not only in industry, but also in education, science, and welfare activities. At no time the Council consisted of more than five members.

In the case of Ahmedabad Textile Industry's Research Association (ATIRA) the Council of Administration consisted of 13 members, seven elected from industry, three co-opted scientists and three representing government. Among the 13 members, there were 5 scientists of distinction.

[5] See Kamla Chowdhry and Vikram Sarabhai, "Organization for Developmental Tasks : Atomic Energy Commission of India", *Indian Journal of Public Administration*, Vol. XIV, No. 1, p. 1-22.

[6] Kamla Chowdhry, "Institution Building and Social Change: The Ahmedabad Textile Industry's Research Association", *Indian Journal of Public Administration*, Vol. XIV, No. 4, p. 943-61.

The Governing Boards did not consist of members with impersonal relationships. In both the Atomic Energy Commission and the Ahmedabad Textile Industry's Research Association, there was a core of interacting cluster of scientists who influenced policy-making. These scientist-members were on each other's Boards, involved in similar activities of institution building, and lending understanding and support to each other. These scientists had known each other for many years, participated in many meetings together and had many professional and personal shared experiences in common. The important aspect to be emphasized about the Governing Boards was its small size which permitted meaningful interaction; the members had close professional and personal relationships; and the mix of members provided cross fertilisation of ideas useful to institution building.

The Director

The early history of the Atomic Energy Commission was so closely interwoven with that of the Tata Institute of Fundamental Research (TIFR) that Bhabha's early role in both institutions need to be considered simultaneously. In 1944, when Bhabha became the Director of the Tata Institute of Fundamental Research, he was in his early thirties. In 1948, when the Atomic Energy Commission was set up, Bhabha became the first Chairman of the Atomic Energy Commission at the age of 36.

Bhabha functioned in 4 roles simultaneously, as the Chairman of the Atomic Energy Commission; the Secretary of the Department of the Atomic Energy; the Director of the Bhabha Atomic Research Centre; and the Director of the Tata Institute of Fundamental Research. In other words, Bhabha's four roles combined policy and executive action, and the 'feedback' required for effective decision-making.

When Sarabhai was requested to be the first Hony. Director of the Ahmedabad Textile Industry's Research Association (ATIRA), he was in his late twenties. He also combined at least four roles in his functioning. Besides being the Hony. Director, and a member of the Governing Council of ATIRA, Sarabhai managed Sarabhai Chemicals and other Sarabhai industries, and was also the Director of the Physical Research Laboratory. Here again, there was a combination of roles which strengthened policy making and implementation by the familiarity and knowledge he brought of the scientific method on the one hand, and of the managerial practices in industry, on the other hand.

Both Bhabha and Sarabhai had close personal relations with most members of their Governing Councils. They received from their

Councils a high degree of trust and confidence and consequently conditions of autonomy. In turn, they were able to give conditions of trust and autonomy to their scientists.

In both cases the leadership style was to lay down broad lines of work and to provide to their staff the greatest possible freedom to develop new ideas and fruitful lines of work. Both Bhabha and Sarabhai conveyed confidence and esteem for their scientists. When there were difficult projects to be handled they were not inclined to play safe by relying on foreign consultants. By supporting Indian scientists they were able to build their self-confidence for more complex projects.

Organization Structure

Bhabha's approach to organizational planning was evidenced by his statement "no organization chart of the future development of the Institute was submitted either when it was founded or later, and the philosophy has always been to support ability wherever it is found in the fields of work covered by the Institute"[7]. Thus an example indicative of this approach was the situation in which the Electronics Research Department and the Electronics Production Department (Bhabha Atomic Research Centre), both conducted some research and both manufactured some instruments. This was to enable the scientists and the engineers concerned to pursue their interests without being hampered by departmental boundaries.

In the case of Ahmedabad Textile Industry's Research Association (ATIRA) too, although a sub-committee of the Council had planned an organization structure, this in fact was never adopted. The sub-committee's proposals were based on a report from a consultancy agency in New York. The organization structure that in fact developed over the years was based on the ability of the various groups to expand fruitfully. When an attempt was made by a new Director to rationalize the organization structure according to a preconceived plan, ignoring the interests of the scientists, the morale of the scientists was seriously affected. Subsequently (with the third Director), modifications in the organization structure had to be made again to suit the competence and interests of the scientists concerned.

The scientists in Atomic Energy Commission and in the Ahmedabad Textile Industry's Research Association were rewarded according to their work and their development, and not according to vacancies

[7] H. J. Bhabha, *Science and Problems of Development*, op. cit.

available in the organization chart. This system of rewards also made it difficult to work according to a rigid plan of the organization structure.

The main point to be emphasized in organizational planning was that the organization was built around people. A pre-planned organization structure did not become the blue print for recruitment or for future action.

Administrative Practices

Both in the Atomic Energy Commission and in the Ahmedabad Textile Industry's Research Association, administrative procedures were evolved by the scientists and technologists themselves rather than by an outside administrator. Within the broad policy set, research groups discussed and defined their objectives and targets. When research projects were approved associated with it was approval of budgets, equipment and manpower. Budgetary and other controls were self-contained in the formulation of projects.

Administrative procedures were evolved by the research workers themselves according to the needs of the scientific laboratory. In both places the section called "administration" was considered a service function rather than a control function.

In both these institutions hierarchical authority and positional status were de-emphasized. There were Committees in which scientists from different levels were put together for discussion of research projects and formulating administrative policies.

The conditions under which scientists and professional workers are motivated are somewhat different from those who work in bureaucratic or industrial enterprises. Money, hierarchical status and power are important needs for most, but to scientists and professional groups the need for autonomy of working conditions and self-development are even more important. As working scientists Bhabha and Sarabhai recognized that motivation and control are largely inherent and contained in professional commitments, and their administrative practices reflected this approach.

IMPLICATIONS FOR DECISION-MAKERS

Interacting Clusters

It was found that the growth and development of scientific institutions was influenced by small interacting clusters of members with

different experiences and competences which provided the innovative base for policy making and achievement of scientific projects. The members of these clusters were intellectually stimulating and also emotionally supportive to each other. These were found at the Board level as well as at the operating level of the scientists.

The question for decision-makers is whether interacting clusters be consciously created or are they the outcome of unusual circumstances? The experience abroad and at the Indian Institute of Management is that such interacting clusters can be consciously planned and created. Thus, in the initial stages of the growth of the Indian Institute of Management, clusters of 5 to 8 faculty members were consciously developed by providing conditions wherein they had to perform interactive and overlapping tasks. It was found that such tasks also provided opportunities for establishing personal relationships. The formation of such clusters wherein members have a close professional as well as a personal relationship is important for institution building and for finding unique solutions to new emerging problems. However, more research is required to indicate the nature of creative clusters and the conditions of trust required for innovative tasks.

Shaping the Organization to Fit People

We found that both in the Atomic Energy Commission and in the Ahmedabad Textile Industry's Research Association, the organization was shaped to fit the competence and interest of the scientists concerned. The organization chart did not determine the recruitment of people, but the availability and the growth of the scientists determined the structure of the organization. An organization that is shaped to the needs, skills and attitudes of its members conveys a relationship of respect and trust. Some decision-makers do it consciously like Bhabha and Sarabhai, others achieve it without realizing it.

Transfer of Administrative Cultures

We have indicated that imitation of administrative practices from institutions which have different assumptions and different objectives can be dysfunctional to the growth and development of new scientific institutions. Both in Atomic Energy Commission and in Ahmedabad Textile Industry's Research Association, the scientists themselves defined their work within the broad objectives set, and evolved the administrative practices required. Administrative practices were neither imitated from the West nor borrowed from Government. When the Atomic Energy Commission was established, Bhabha

transferred some administrators who had developed whithin the culture of the Tata Institute of Fundamental Research. The Council of Scientific and Industrial Research, on the other hand, 'transferred' Government administrative practices by appointing planning officers from Government to help in the initial establishment of the scientific laboratories.

Perhaps, one way of establishing new institutions is to have a "spin-off" from the more established and successful institutions. An established institution like the Tata Institute of Fundamental Research through the commitment of a small group of outstanding scientists, and perhaps through some initial failures were able to evolve practices suitable to scientific work in India. A transfer of such experiences was useful. It was as if the Tata Institute of Fundamental Research acted as the nursery for the growth and development of scientists and administrators-for-science. The concept of "spin-off" for transfer of skills, competences, and cultures need to be considered seriously for establishing new institutions whether in science, higher education, or in industry.

Identity of Institutions

In many of the new scientific institutions established, there has been the problem of research policy. While in the more developed countries there is a range of research institutions wherein research varies from the very practical to the very theoretical, such ranges of institutions do not exist in India. The new scientific institutions of India imitating the more prestigious institutions of the West which adopt research projects having more theoretical rather than practical implications. The scientists in such institutions who seek to make a contribution to theoretical problems find themselves isolated from the intellectual stimulation of colleagues abroad who share their interests. Nor do they have the satisfaction of making relevant contribution to their country's scientific and technological problems.

In India, scientific and technological institutions will have to find their own identity. This may imply new combination of subjects, new combination of theoretical and practical work, and new combination of scientific and administrative roles—combinations which Bhabha and Sarabhai were able to offer to their scientists.

CONCLUSION

Although much can be learnt from examining the organization structure and administrative practices of scientific institutions from

the West, this must be done with understanding and assessment of the particular needs of the situation in the Indian context. I have argued against a strategy of imitation. The experimental innovative approach to the problem of institution building also carries with it important psychological advantages. It conveys confidence in the people who have to man the institutions in the long run. And even if there are initial mistakes and failures, the experience thus gained is likely to be useful to the country.

DEPARTMENTAL MANAGEMENT OF SCIENTIFIC AND TECHNICAL INSTITUTIONS

P. K. Duraiswami

ORGANIZATIONAL innovations and new management systen have many a time emerged out of necessities thrown up by ne functions and activities undertaken by Governments for promotin socio-economic development of the country. In India, we have sever organizational patterns within the governmental system, suited to tl execution of programmes and policies of various kinds. There is tl age-old departmental management system, operating with well-unde stood concepts of hierarchy, line of command and strict adherence t rules and procedures. Some time the top management in the depar mental system is of the board type with a view to providing operation flexibility and functional expertise. These are, then, different types (semi or fully autonomous structures, such as corporations, companie councils, boards, institutes, etc., with a varying degree of autonom They have their own board of directors or governing bodies which n only frame rules and regulations but also lay down policies and revie the performance of the institutions under them.

The objective sought to be achieved through these varying patterr of organization, however, is to facilitate the best performance of tl tasks to be undertaken. The suitability of a set-up, therefore, is broadl related to the nature of activities to be performed. Activities of regu latory nature, such as those of police, which seek to regulate th behaviour of the individuals and the community, can be adequatel performed in a hierarchical set-up, structured for quick communicatio and compliance of commands. Industrial and commercial activitie on the other hand, may perhaps, be best entrusted to semi or full autonomous bodies. Within the semi-autonomous/autonomous sec tor, activities of scientific and technical nature, whether directed t "research and development" or for rendering a service for social an economic uplift would require a special organizational set-up, designe to facilitate meaningful and productive interaction in the profession working force, horizontal communication and control operation flexibility and maximum freedom and authority for action/work.

In India, the scientific and technical institutions can broadly b classified into three categories. The first group consists of institution

which are engaged in pure research or R & D activities, such a
Council of Scientific and Industrial Research, Bhabha Atomic Re
Centre, Telecommunication Research Centre under the Minis
Communication, etc. The second category would include org
tions which perform only a service function of executing gover
policies and programmes with technical or scientific content—for
they employ technical personnel and use sophisticated equi
Research in such institutions is conducted only very marg
In this category would fall institutions like the Public Works D
ments. The third group comprises institutions which combine in
both research and service functions, such as, Geological Sur
India, Survey of India, etc., and the India Meteorological Depar
In India, the institutions falling in the last two categories are org
on a departmental pattern while those engaged exclusively in
research or R & D have mostly some form of an autonomous
The discussion which follows relates to *both* these categories.
not just limited to scientific research institutions but also cove
cutive agencies and departments engaged in a service function w
largely technical or scientific in content.

Delegations

As compared to scientific institutions organized on autor
pattern, the departmentally managed technical and scientific
enjoy much less operational autonomy. Notwithstanding some
increases in delegations in certain cases, these institutions, by an
do not have adequate powers which are necessary for the su
performance of the task assigned to them. Further, the dele
made are hedged by such conditions as make them infructuous
controlling administrative departments are mostly averse to del
power and authority. This picture is equally true in the case o
nizations other than those engaged in scientific and technical a
The adverse consequences of lack of delegation are, however
pronounced in the case of scientific and technical institutions. It
under-utilization of costly and sophisticated machinery and equi
delays in execution of engineering or other technological p
involving huge expenditure, frustration, and dampening of mora
motivation which are of vital significance in scientific activity
measure of operational freedom and the extent of delegation r
be related to the nature and volume of responsibilities irrespec
the fact whether a scientific and technical institution is managed
mentally or controlled by an autonomous research council.

Relations with the Secretariat

The scientific and technical institutions managed departmen

usually accorded the organizational status of 'attached' or 'subordinate' offices of the secretariat department or ministry concerned. The normal financial and administrative controls, which apply to other attached and subordinate offices also apply to them. This system, which is a legacy of the British Rule, is based on dichotomy of policy and execution. Differentiation between policy-making and executive organs is mostly found in the countries which have been or are under the colonial rule. The present pattern of relationship between the secretariat and the executive agencies is outmoded; it is incongruous with the growing specialization within the governmental machinery and the increasing inter-dependence among its various parts. This system is ill-suited to the requirements of technical and scientific organizations engaged in developmental activities of one kind or another. The inadequacy of the traditional pattern is borne out by the growing trend to accord *ex officio* secretariat status to the heads of executive agencies. Another development of some significance is the induction of technical advisers in secretariat departments. This practice, however, has not worked satisfactorily. It has created internal tensions. The role of the technical advisers is at best of a peripheral nature. They tender advice as and when called upon to do but do not directly participate in policy making and managerial discussions.

The Study Team on the Machinery of the Government of India and its Procedures of Work, set up by the Administrative Reforms Commission, has, in its final report, recommended a total abolition of existing discrimination between the secretariat and executive agencies. It has also favoured the integration of the headquarters of all major executive departments with the secretariat. The Administrative Reforms Commission have, however, in their report on the subject, supported the integration with the secretariat only of such executive agencies as are engaged in planning execution, coordination and review of a single development programme or several allied programmes covering a substantial area of activity. The Commission have excluded survey and research institutions from its scheme of integration, as these require operational freedom for their effective functioning and need to be insulated from the secretariat's *direct* involvement in their work. It deserves to be noted that the Commission have, here, made a distinction between research and survey institutions and executive departments engaged in developmental activities of scientific and technical character. About the latter the Commission observe: " . . . the need for integrating executive and policy-making functions is most essential in case of developmental activities of scientific and technical character, a bit less so in areas calling for functional specialization and much less so in activities concerned with general administration."

On the whole, the recommendations of the ARC Study Team are much more progressive than those of the ARC itself. The Study Team has based its conclusions on a detailed analysis of the existing position in India and the practices in advanced countries abroad. If the recommendations of the Study Team are accepted by the Government, it would mean that the existing invidious distinction between the secretariat and the non-secretariat organizations will disappear. The psychological impact of such step will be far-reaching. It will make for smooth relationship between the secretariat and the field units and transform the present secretariat approach of a negative character into one of providing positive guidance and help to the field agencies. It will help remove the inferior status of the heads of the non-secretariat organizations, including those of scientific and technical institutions, in relation with the secretariat and enable them to participate actively in decisions on policy issues relating to technical and scientific matters, taken in the secretariat. Creativity in scientific institutions cannot grow if their heads smart under the feeling of inequality of status and if their initiative is continuously stiffled by frustrating delays in the secretariat.

Personnel Policy and Practice

It is not only the organizational relations between the departmentally managed technical and scientific institutions and the controlling administrative department which need to be reoriented. The current personnel policies and practices adopted by the government in regard to these institutions also need a basic change in several respects such as recruitment, promotion and staffing structure. Scientific and technical institutions need to be governed by a personnel policy which is specifically directed to the development of professional competence and motivation of a high order and promotion of creative thought, professional interaction and team spirit.

Selection Procedures

Recruitment of scientific and technical personnel for the departmentally managed institutions is done through the Union Public Service Commission (UPSC). The Atomic Energy Department perhaps is the only exception; it has its own system of selection committees. The institutions organized as registered societies, such as, CSIR, ICMR, are exempted from the purview of the UPSC on account of their being semi-governmental organizations.

The UPSC has performed and continues to perform a useful

service in the recruitment of personnel for non-technical jobs. They have developed necessary expertise and experience in this field. But it is of questionable validity if the UPSC system works with equal success in the recruitment of scientific personnel. Professional Science has proliferated into innumerable specialized disciplines. Correct evaluation of the worth and potential of a candidate in a discipline presupposes on the part of a selection board a fairly advanced knowledge of the discipline concerned. In the various branches of medical sciences, for example, the specialization has progressed so much that a medical man, who is not specialized in the field in which selection is to be made, may not be able to make correct judgement. The UPSC does invite experts to assist it in making selections for specialized posts. But it is doubtful if this advisory system, which does not place the responsibility for selection on the experts squarely, has succeeded in selecting the best talent. A better alternative would be to entrust this responsibility to the department itself. The UPSC, as an expert body for the selection in general may be concerned only with the broad recruitment policy and selection techniques to be followed by these departments.

It may be of interest to make a mention, here, of the demand made in certain quarters for bringing under the purview of the UPSC the recruitment of scientific and technical personnel of autonomous organizations like the CSIR, ICAR, etc. There is no doubt that the UPSC enjoys the reputation of a high degree of objectivity and impartiality in selections. Therefore, if the UPSC can make suitable changes in its membership and cast the net wider in selecting scientific talent, it may be worthwhile to continue the recruitment for departmentally managed technical institutions through the UPSC. This can, however, only be a second best arrangement. Delegating the responsibility for selections, to the departmental heads, who may in this be aided by a group of eminent professional people, will be the best arrangement.

Career Advancement

A good personnel policy should ensure not only the recruitment of the best talent but also a system of career development, proper placement of personnel and built-in incentives for better performance and professional growth. This calls, among other things, for a carefully devised promotion system. Autonomous organizations, like the CSIR and the Atomic Energy Commission, have their own rules for promotion of their personnel which permit considerable flexibility and quick promotion opportunities depending upon the performance of the individual officers. But the departmental organizations are still bound by

the normal rules of the Government which give undue weightage to the seniority as opposed to merit. The scientific and technical institutions have for their personnel challenging responsibilities of creative nature. For motivating the personnel to maintain a sustained interest in shouldering such responsibilities and putting in their best, it is necessary that they should have adequate incentive by way of opportunities for promotion. For this two things are urgently called for. Firstly, as in the case of autonomous institutions, the existing opportunities for promotion should be enhanced so as to provide for at least three substantial lifts to the scientists and technologists in their career. For personnel of exceptional ability and performance the prospects should be still brighter. The scientific and technical personnel of departmentally managed scientific and technical institutions, who are talented and have shown good performance, should not be allowed to stagnate for want of higher posts in the department. They may even be allowed to move to other scientific or technical positions in autonomous organizations without loss of service benefits.

Staffing Structure

There has been a growing demand in the recent years for constitution of separate cadres or services in those areas of technical and scientific specializations where they do not already exist. Even the idea of a central/all-India scientific service has been mooted in some quarters. Recruitment to technical and scientific posts individually without their encadrement into any service has certain advantages. But the disadvantages of such a practice are overwhelming in the context of lower salaries of technical and scientific personnel in government as compared to the lucrative emoluments available to their counterparts in industry, the different constraints under which scientists and technologists have to work in a government or semi-government organization and 'service' consciousness which pervades the governmental system. The constitution of suitable cadres will institutionalize the opportunities for rising higher for the scientific and technical personnel. It will also help them to secure their rightful place in the administrative system. At present, scientists, technologists and other specialists are, in practice, virtually denied their due share in the senior management level at the headquarters of the government. If some of them have been able to get in, it is as a matter of grace or dire need—as an exception than the rule. Scientific and technological advance cannot make much headway in India if the door is not open to the competent technical and scientific personnel, possessing also the needed managerial ability, to rise to higher positions in government. This point has a special significance in the case of departmentally managed technical and scientific

organizations. Technical and scientific personnel deserved to be treated on par with others in all service matters, including manning of senior level positions at the headquarters of the government and the constitution of all-India services.

Here, it would be of interest to point out that given organizational ingenuity, there *need not be* any conflict between the constitution of technical and scientific posts into one or more services *with* the needs of specialization and sub-specialization. We shall illustrate this point by referring to the All India Service proposed for Medical and Health. Under the scheme, each State Government will have a cadre of the Service, and there will be a separate cadre for the Union Territories. Each cadre will consist of all posts of and above the level of Civil Surgeon and other equivalent posts, both on medical and health sides. Each cadre will also include equivalent posts of senior specialists. Teaching and research posts can also be treated as duty posts in those State cadres where the State Governments concerned agree to their inclusion. Other States could post the cadre officers on teaching and research posts against the deputation quota. A limited number of highly specialized posts under the Central Government, for which doctors with suitable qualifications may not be available in the Service, will be continued as isolated posts outside the Service.

A view is taken in certain circles that the proposed Indian Medical and Health Service is not a step in the right direction. Within the rapid development of medical science, the need is for increased specialization. The operation of the principle of inter-changeability of personnel between different posts, which is fundamental to the concept of a service, is likely to adversely affect the growth of specialization as well as create situations in which square pegs may be fitted to round holes. Against this, it may, with justification, be pointed out that the Service may be divided into a number of branches and sub-branches on the basis of specializations needed; and a sound system of career development and management may be installed to ensure both specialization and vertical mobility. Within each branch, there should be an adequate number of posts in different pay grades to facilitate the moving up of those who develop more specialized competence. The emphasis should be on specialization within a particular branch for the first 10 to 12 years of service of new recruits. Some of them, who show aptitude for management, may, later, be allowed to move to administrative positions after being put through suitable programmes of management training. Such of the latter who wish to return to their speciality, after a spell in administrative posts, may be allowed to do so. Those who are already occupying management positions may also be permitted to shift to a speciality for which they have needed

qualifications and experience. As new specializations develop or the level of specialized competence advances, suitable changes may be made in the internal structure of the service, the number of posts in each pay grade and cadre management policies. These are some tentative suggestions and can be given a concrete form after some further thinking and discussion among the members of the medical profession and experts on civil service matters.

Conditions of Service

It is no less important to ensure fair conditions of service to scientific and technical personnel. It is a common knowledge that, with some exceptions, technical and scientific man-power is, by and large, not available in our country in the requisite numbers. For instance, in the field of medical education and public health the situation continues to be acute despite the increase in the number of medical colleges to 93, with a total admission capacity of about 12,000 annually. This area has suffered most from the "brain-drain". On account of poor prospects in terms of pay scales, promotion and working conditions, the flight of technical and scientific personnel continues unabated. Those who go out for advanced study or research are often reluctant to return for similar reasons. The measures so far taken to check this brain-drain have largely proved ineffective. The problem merits some serious thinking at the highest level. It will be unreasonable to expect that the pay scales of the scientific and technical personnel should compare favourably with those of their counterparts in advanced and affluent countries like the United States. I am sure, our scientific and technical personnel do not always crave for that. But what distresses them is that their pay scales are not related to the significance of their work in the programme of national development. The pay scales allowed to the administrative service provide a ceiling beyond which the scale of pay for any service cannot go, unlike in U.S.A. and U.S.S.R. There is, thus, the need for reorientation of our thinking with regard to relative importance of different services in the national development and revising our pay structures accordingly.

Professional Interaction

Continuous interaction between the personnel of the departmentally managed scientific and technical institutions and those employed in the same field under semi-autonomous or autonomous organizations is of vital importance for the deepening of technical competence of the former and widening their professional horizons. Opportunities at present available to them are in many cases very much limited and

need to be enlarged. Scientific and technical personnel working i
departmental institutions should be encouraged and given facilitie
to participate in professional seminars, symposia and group discussions
It would be worthwhile to set up a professional advisory group for eac
such institution, where it does not already exist. The advisory grou
should include a fair proportion of members drawn from relevan
autonomous scientific and technical institutions.

Financial Problems

Quite a few of the difficulties of the scientific and technical institu
tions, managed departmentally, also arise from the inadequacy o
unsuitability of policies and procedures of financial managemen
adopted by the controlling secretariat departments. Here, the want o
adequate delegation again is the main hurdle. Some of the individua
scientists and technologists may not be directly effected by the lac
of delegation but projects and schemes inevitably suffer. Th
departmentally managed institutions face some serious difficulty i
procurement of technical stores and equipment. Scientific equipmen
is generally of sophisticated nature and has strictly to conform to th
specified standards. There are various items for which there are no
many suppliers in the country. The departmental procedures do no
take due note of such situations. Unlike the autonomous institution
(*e.g.*, the CSIR and Atomic Energy Commission), the departmentally-
managed technical and scientific institutions, under the Centra
Government, have to obtain their stores through the Directorat
General of Supplies and Disposal. This, by and large, means need-
less delay, going through complex formalities and sometimes acceptin
sub-standard quality of equipment or stores. The DES&D can be
useful source for routine supplies to be obtained in bulk quantities
but not for procurement of highly sophisticated equipment. It i
necessary that the departmentally managed scientific and technica
institutions should be taken out of purview of DGS&D for obtainin
their stores of the latter type.

It is desirable that the scientific and technical institutions should
have full powers to operate their budget within the sanctioned amount
particularly in the matter of approved programmes of work, without
being required to approach the secretariat for expenditure sanction
or administrative approval. They should be competent to create and
fill posts without the necessity of further financial sanction or approval
provided that the total expenditure on salary and allowances for al
staff is within the amount for this "head" as sanctioned in the budget
The institutions should also have the power to re-allocate funds in

connection with expenditure on approved schemes, within the budget from one revenue head to another and from revenue to capital but not from capital to revenue. The head of the institution should be able to delegate his authority in these matters to appropriate levels under him.

Review and Appraisal Performance

There is at present no established system for appraisal of the working of departmentally managed scientific and technical institutions. They bring out annual administrative reports which are sometimes discussed in Parliament. The Estimates Committee and Public Accounts Committee have from time to time reported upon some of these institutions and made useful suggestions for the improvement of their organization, economy on staff and better financial management. But there have, by and large, been no review committees, as in the case of autonomous bodies like CSIR and ICAR. It would be desirable to set up periodically, say, once in five years, an expert committee to appraise the performance and administrative working of each of the major departmentally-run technical and scientific institutions and to make suggestions for improving their internal structures, methods of work and personnel practices. These committees may be composed of leading specialists in the concerned field, an expert in organization and systems analysis and one or more eminent public men.

Conclusion

The administrative problems of departmentally managed scientific and technical institutions differ in several respects from those of semi-autonomous or autonomous bodies engaged in scientific research. A good many of those differences are due to the fact that the departmentally-managed technical and scientific institutions mostly have a service function involving work of a technical or scientific nature. The quantum of research they undertake varies and such research is mostly of an operational character, having a close bearing on the main service function of the organization. As compared to autonomous bodies, scientific and technical institutions managed departmentally, suffer from several drawbacks in matters of operational autonomy and flexibility of personnel policies and practices. They have to work under the traditional system of departmental rules and regulations which are hardly conducive to the exercise of initiative and achievement of results. Heads of the departmentally managed scientific and technical institutions have the added disadvantage inasmuch as the controlling administrative departments act as a break on their initiative and desire

to achieve something new and substantial. The inferior status th(enjoy in their relations with the secretariat detracts from their sense (pride and professional commitment. The answer to all these problen partly lies in reorganizing on semi-autonomous or autonomous bas some of the technical and scientific activity which is at present carri(out departmentally. However, with the expanding responsibilities (government in the sphere of development, quite a sizable scientil and technical activity will have to be administered departmentall In such a circumstance, it is imperative that the existing administrati patterns and procedures and personnel policies and practices should t *basically* reoriented to meet the particular needs and circumstanc(of scientific and technical institutions which are run departmentall

ORGANIZATION AND MANAGEMENT OF SCIENTIFIC RESEARCH BY AUTONOMOUS BODIES

V. Ramalingaswami

SCIENCE as an economic technique has proved to be an incredibly powerful force which has transformed and enriched human life during the past 150 years. The twin purposes of science are the gathering of knowledge and its utilization for human welfare. We have some of the former but too little of the latter in India.

The character of a scientific society is determined by the opportunities it provides for initiative. Science flourishes best when a scientific ecology or climate is established. In the second half of the 20th century, it would be unnecessary to have to reiterate that a good measure of effective and functioning autonomy must characterise scientific institutions. Nevertheless, the poignancy of the situation in India does require reiteration of this principle and what is more, translation of its message into practical reality.

Here in India, we are faced with a paradoxical situation. Many of our institutions of higher education and learning have been given, on paper, a good measure of autonomy with the full and deliberate intention on the part of policy makers to create an environment in which free expression of scientific talent at all levels may take place. When the policies are translated into rules and regulations which affect the daily work of the scientists, the spirit of liberalism and progressive reform has been washed way. Bertrand Russell once said, "If we are to restore prosperity, we shall have to find ways of emancipating energy and enterprise from the frustrating control of constitutionally timid *ignoramuses*." The time has come for an agonising self-appraisal of the objectives with which our scientific institutions have been founded and of the impediments that lie in the way of speedy achievement of those objectives. What is needed is autonomy not only in word but also in spirit.

PRINCIPLES OF MANAGEMENT OF SCIENTIFIC RESEARCH

Identification of Essential Questions

With limitations of resources in a developing economy, allotment

of priorities is necessary. The primary focus should be on essent questions without diversion into attractive side lanes of interesti irrelevance. The research should be discriminating, intensive, cc tinuous, not of a grass-hopper type. A profound study of phenome with precise objectives leading to practical measures of socio-econon upliftment should receive major emphasis in a developing soci A thin spreading of meagre resources over a wide front would prodı no results. Men working in our scientific laboratories must have cl links with the national life in the crucible of reality. Science mı diffuse as a conscious effort throughout society.

Nurture of outstanding men

Men of outstanding merit and competence must be identified a placed in an environment where they could be maximally producti We suffer from an excess of mediocrity and a scarcity of excellen This is generally true all over the world but the problem is more acı for a country of this size.

Challenge of insecurity

The challenge of insecurity should always be before a scienti He must know that he can rise by work and not by flux of time. C portunities to rise in the profession must be in proportion performance and ability. It is not merely enough to encoura excellence, it is necessary to discourage mediocrity.

Decontrolling of Science

Decontrolling of science is a vital factor in its growth. T administrative structure of a scientific institution must be based on clear identification of factors that directly affect the work of a scient and of the processes by which good work is produced and sustain The administrative machinery should be resilient and quick-acting order to respond to the often unforeseen requirements of scienti endeavour.

Personnel problems and policies

Recruitment of personnel and personnel policies in a scienti institution cannot be the same as those that apply to secretarial servic The application of secretarial procedures to the administration science has tended to destroy scientific endeavour.

Audit of achievement

The work of scientists must be constantly under review and there should be an audit of achievement as much as an audit of accounts.

Financial arrangements

Financial arrangements are perhaps the most serious impediments. The procedures required for procurement of equipment and materials as prescribed by Government are so time-consuming and infructuous that they can hardly be applied to a scientific institution. By following the prescribed governmental procedures, it is well known that materials arrive at the point where they are needed far too late, their quality can never be assured and the price eventually paid would probably not be small. Once a budgetary provision has been made for the overall activities of an institution, no further reference to government or finance should be necessary. While no institution can be free to appoint as many academic staff as they think fit even in affluent societies, scientific institutions should have a considerable measure of discretion to suit their practical needs as is the practice in all the progressive universities of the developed countries. An institution should be able to determine in which grade and at what point of scale within a grade it would be best to make appointments. Institutions should be allocated additional sums of money within the professional grade for the payment of differential salaries, thus enabling them to recognize special merit or difficulties of recruitment. While government which is the sole source of support for research institutions in the country should influence the broad direction of development of such institutions and within the framework of such development, prescribe the overall level of recurrent and non-recurrent grants, there should still be considerable leeway for the scientific institutions to have a significant say in the matter of determining the size, rate and character of its development. The system of block grants for recurring expenditure ensures freedom from detailed control by outside bodies, thus preserving for our scientific institutions effective autonomy in carrying out their work.

Perhaps the most poignant analysis of this problem in recent times has come from Dr. Sarabhai in an address to the Indian Institute of Management, Ahmedabad, in April, 1967. He described the hierarchical organizational structure involving vertical controls which characterise governmental administrative machinery initially designed for the maintenance of law and preservation of social order. The administrative service in such institutions is characterised by a virgin-like anonymity coupled with absolute security. The system has

controls which act negatively attempting to stop a wrong thing from happening. In an attempt to focus on the kind of set-up needed for the developmental tasks of scientific research. Dr. Sarabhai quotes some of the outstanding features of organization of the Atomic Energy Commission of India as evolved by the late Dr. Homi Bhabha. Organizations were built around men and no rigid hierarchical system stood in the way of recognizing and rewarding talent wherever it was found. Administration performed largely the role of service and control was exercised through discussion. Absolute autonomy of working conditions and opportunities for self-development were important features. As Dr. Sarabhai states "structure, procedures and techniques are important but these must be sustained by a cluster of attitudes conveying care, trust and nurturance on the part of responsible persons". There must be an effective system for discovering talent, for encouraging the gifted and for giving opportunities to those who advance through their contributions. The U.P.S.C.'s approach which is seemingly democratic and above board does not quite suit the requirements of a scientific situation. Research institutions themselves like the universities in England should be empowered to promulgate ordinances, decrees, graces and regulations which are subsidiary to the broad character of the constitution of the institution.

MEDICAL SCIENCE, THE CINDERELLA

In all parts of the world and in all academic institutions, as a general rule, there is a gulf separating constitutions on paper and administration in practice. A mere description of the functions and objectives of scientific institutions does not necessarily indicate where the real sources of power and controls vest and what impediments there might be to the expeditious development of ideas and programmes. The objectives of all scientific and research institutions, if defined in a Parliamentary or other charter, read well and are often inspiring. It is futile to present a detailed picture of the working of a number of our so-called autonomous institutions to indicate the points where the difficulties lay. On the basis of the principles indicated above, which are neither new nor startling as they have, for over a century, formed the backbone of a Science Development Policy in some of the technologically advanced countries of the West, there should be no difficulty in developing an administrative structure for our scientific institutions which would incorporate these principles. Of all the branches of science, it is medical science that is languishing most under the heavy pressure of inflexible governmentalized administrative structure. There are 94 medical colleges in India today. The vast majority of these are controlled directly by the long arm of the medical

departments of the government either in the States or in the Centre. The medical colleges are the cradles where young physicians in training ought to be learning medicine in an atmosphere of enquiry and research. With the exception of a few constituent colleges of universities, the rest have formal, tenuous and unproductive links with the universities. Recruitment of personnel, the growth and development of scientists, opportunities for rewarding talent, all these have to be performed within the rigid framework of governmental administration. The result is not far to seek. The quality of our research output is infinitely less than what it could have been, had there been a truly liberal and progressive type of university administration running these institutions, an administration that would give increasing responsibility to the teachers and investigators in the formulation of broad policies and programmes and in their implementation.

There are then a number of research and post-graduate training institutions such as the All-India Institute of Medical Sciences and the like which are created by Parliament and meant to function fully as autonomous organizations. The gap between principle and practice, however, is quite wide.

THE LAST CHANCE

The interesting thing about India is that although it is classified as a developing country in many respects, it is over-developed in some respects. There is talent in abundance, the greatest human resource on a vast scale. There is a strong desire and enlightenment at the highest levels that the true spirit of the Science Policy Resolution should be implemented. The problems are identifiable. The answers are clear enough. Will we have the courage to make the changes in the administrative structure so as to make autonomous institutions truly autonomous? We cannot afford not to do it. This may well be the last chance.

SCIENTIFIC RESEARCH—THE PROBLEM OF COST

T. R. Seshadri

PROVISION of adequate finance for scientific research is of great importance for scientists and society alike. Science makes increasing demands based on a wide spectrum of considerations ranging from purely cultural and intellectual values to practical benefits in matters of food, health and defence of the nation. The problem of financing scientific research is quite complex because of the large variation in the nature of the sciences and their requirements. For example, physical and natural sciences are largely basic in nature, engineering and technology deal with applications, agricultural sciences deal with soils, crops, animals and food, and medical sciences are interested in human and animal diseases and their cure. However different they might have been in earlier history, all of them seem to have followed in recent years a definitely common pattern: basic research in the laboratory, development on a large scale, extension work, field and market trials and established production for consumption. It is significant that agriculture is now practised as a technology and so is the production of drugs and surgical instruments and materials. Therefore, general principles of financing apply to all of them though details may differ widely. Besides, economic and practical considerations, political pressures also play a part in taking of decisions. In this matter the maturity of a nation in practical politics is important for placing emphasis on economic and rational practical values rather than on prestigious and changing political factors.

Value of Scientific Research: There is no doubt that science is most ancient because it is the basis of all creation and of existence. What we do continually is only to gain greater and greater understanding of science and its operation. For millions of years after the origin of man, acquisition of scientific knowledge progressed very slowly. It increased in tempo during the past few centuries and is at present in a stage of explosion. It has effectively penetrated all activities of society and we have therefore rightly claimed this age as an age of science. Scientific research has become so important in public interest that nations are anxious to provide adequately for it in their budgets. Scientists who not long ago conformed to the academic tradition of simple living and high thinking, have now

to worry about the management of large institutions, teams of scientists and multifarious machines. Therefore, financial needs of research assume importance and require careful consideration.

It has long been recognized that scientific research intended to push forward the frontiers of knowledge is an essential function of universities. It has now become an essential part of the machinery of government and industry also. The Government is interested in ensuring the defences of the country and protecting the freedom of the nation besides maintaining law and order and public health. Further, a welfare state is very much concerned in improving the productive economy. In a competitive world industry has to maintain and improve existing processes and discover and develop new ones for survival and for expansion. For these purposes the application of science has become a matter of primary importance.

Increasing Cost of Scientific Research: Scientific research has become increasingly costly. In developed countries the increase has been spectacular from the beginning of this century. Currently in many cases it is nearly hundred times as much as in 1900. Even allowing for the depreciation in the value of money and the rise in wages, the increase is very large and is accounted for by many factors.

Growth of Institutional Laboratories: During the last century and the early years of this century research laboratories were simple organizations and scientific research was the concern of gifted individuals or of small groups centred round them, working on subjects that interested them. As the present century advanced it has witnessed the rapid growth of institutional laboratories employing hundreds and sometimes thousands of workers forming numerous sections and demanding space and special equipment of high cost and complexity. Even now much of the progress depends upon the creative genius and penetrating vision of the select few. But the large numbers have to provide the team work particularly in the development of the ideas to a fruitful end. Though it has been said that good scientists value highly intellectual satisfaction and good laboratory opportunities, we cannot ignore the fact that the majority of them value good salary scales and security of service besides social status.

Cost of Equipment: In the last century experimental methods and apparatus were comparatively simple. Typical is the example of a President of the Royal Society when asked by a visitor to show his laboratory, brought out a tray which contained all his needs for research. Even during the first quarter of this century the requirements were comparatively small. The discovery of the Raman Effect was made in

a laboratory whose budget was only a few thousand rupees and the instrument used cost at that time a few hundred rupees. At present most of the well equipped laboratories have equipment worth crores of rupees and require large expenditure for their maintenance and for replacements. This will be discussed in detail later.

Research Development, Production and Marketing: Frequently the percentage of the Gross National Product (GNP) spent on scientific research has been used as yardstick for efficiency and a minimum of 1 per cent has been insisted for developing countries. Much depends naturally on how it is utilized. In the third Royal Society Technology lecture (1969), on Research and Development leading to viable production, Jones has emphasized that the amount of research spending is not a good index of achievement in terms of GNP. With less spending Japan and West Germany have produced more as compared with UK and USA. His analysis of the components of the Industrial cycle is significant. It consists of (1) research, (2) development, (3) production, (4) marketing, and (5) profits. In introducing a new product he has estimated that if R & D costs 15 per eent, the remaining 85 per cent should be spent on market research and application research and other items related to the introduction. For the success of technology, employment of highly trained people in the production and marketing research is considered to be important. They should be capable of understanding and transmitting market pressures to the R & D sectors and orient them correctly. Over-riding importance of marketing as a necessary component of technology has to be accepted for using manpower efficiently to produce wealth. The only way that any large R & D expenditure could make an impact on wealth is to undertake that work strongly under the influence of market pressure and not in isolation as at present.

Considerations for Correct Budgeting: It is, therefore, clear that the cost of research should vary considerably with its type. It is considered to be minimum for basic research particularly in universities, which has therefore been named 'little research'. It is far more for research under governmental auspices, particularly where developmental work is the main aim and highest in the industrial laboratories where large scale trials are made, and market research is equally expensive. The present is a period of great instability in many respects, particularly in our country, regarding money value, research needs and changing patterns of scientific application. And, therefore, financial requirements can be stated only in general terms and have to be worked out correctly for each case and occasion. Further in the immediate past, especially in post-war years, research has been an expanding affair with industry

being buoyant. But we are now in a time of too little money and too few capable men to man the jobs efficiently; increasing attention has therefore to be given to the wise economy of our resources. This can be done correctly only by a clear and full reassessment of our organization and methods. The value of Rutherford's famous remark "We haven't any money; we have got to think" should be fully appreciated. Assessment of relevancy is important. What is not needed cannot be tolerated even if it is cheap.

Staff Pattern: Considerable economy can be effected by adopting a correct staff pattern. A highly qualified research scientist should not be utilized for doing work which could be done by technicians and assistants. Delegation has the double advantage of saving the valuable time of the research scientist and further having the delegated work done by a man who is specializing in it and is an expert in the practical technique. Frequently scientists are expected to keep records of stores and correspondence which can be better done by a clerk with a much smaller salary.

The scientific workers are usually divided into 3 categories: (1) The research scientists, (2) the experimental technicians, and (3) laboratory assistants. The minimum qualification for the first group is M.Sc. in the first or second division with research experience and in many cases they hold doctorate degrees. The second group when properly organized will add considerably to the efficiency of a research laboratory and also to its economy. The minimum qualification for this group is a B.Sc. pass degree, though persons who have passed the Intermediate or the Matriculation examination and possess some experience are also suitable and successful. In India, we are weak in organization of this group and early attention should be given to strengthen it. The third group consists of matriculates having taken science as subjects. In this category also, experience in techniques and ability to use hands and fingers should be specially valued.

The question of the ratios between these groups has been widely discussed. Naturally they are bound to vary, depending on the nature of the work of the laboratories. A fair optimum seems to be 1 scientist: 2-3 technicians: 1 laboratory assistant. There is a great tendency to increase the administrative and clerical staff out of all proportions. In many cases they mean not only more budget, but mean more distraction for the scientific staff.

The importance of the distribution of the staff will be clear when

we realize that in most laboratories it is the most important item in the budget ranging upto 80 per cent. In this area Parkinson's Law works inexorably to the detriment of efficiency of the laboratory. As a laboratory grows the top jobs are increased out of all proportion and no body seems to be able to control the working of the above law. The result is that much less finance is left for equipment and materials because no laboratory can have an unlimited budget. In many laboratories they depend on the windfall of plan budgets for obtaining equipment and materials; this is unsatisfactory and plans lose their main purpose. It will be advisable to keep the staff salaries at 50-60 per cent of the budget, though it can go higher in special cases where a number of mathematicians and theoretical scientists form the bulk of the staff.

Another way the staff budget goes up is the system of speeded-up promotion. The analysis of the qualities for judging the usefulness of a scientist and his fitness for promotion is a very difficult work and should not be left to individual bias. Objective standards have to be worked out and strictly applied as otherwise a double disadvantage arises, one relating to inflated budget and the other demoralization of staff consequent on wrong promotions.

Materials: It has been stated that money is not the primary attraction of a scientist. More important are the facilities for scientific work and the possibilities of "growing up" in science. Therefore, the next important part of laboratory will be its equipment and library. These will be discussed in detail later on.

Earlier in this century yearly budget demands for apparatus and materials were comparatively small except in the case of chemistry where consumable chemicals and a large variety of glassware meant substantial recurring expenditure. Even then 20 per cent of the annual budget was considered to be enough for this purpose. The increased use of highly costly capital equipment has become an established practice and their maintenance and repairs and replacement have become quite substantial. On account of this even in universities the orientation of work to certain lines for which special equipment has been installed is becoming a practice and tradition is being established for having a succession of staff in that speciality. Consequently the annual expenditure for equipment and materials may more appropriately be 40 per cent.

Cost per Research Scientist: Attempts have been made to work out the cost per scientist and use it for comparison of different laboratories. Various factors, however, make such a comparison difficult. First is the definition of the category of research scientist. In some government

and industrial laboratories frequently only the first group is considered, and in some others all the three categories are lumped together. A better procedure would be to fix lower weightage for the technician and laboratory assistant classes, *e.g.*, $\frac{1}{2}$ and $\frac{1}{3}$ of the value for scientists. Even with this adjustment it has not been found possible to compare laboratories of different types such as chemical and engineering laboratories. But among the same groups comparisons are useful.

A different kind of 'cost per worker' calculation is necessary for universities where there are a number of student workers and trainees. One method is to add to the number of the staff are the research fellows and Ph.D. students and a suitable fraction for the number of senior and junior undergraduates and those who take only minor courses in order to arrive at the number of 'effective workers'. On this basis the cost is comparatively small in universities when measured against the output of research work. This is because the category of workers who earn and learn are predominant. This is one of the reasons why basic research is favourably and effectively done in universities.

Apparatus and Equipment: There is an old saying that a man is as good as his tools. Naturally, a man without tools is incapable of doing his work effectively. For example, improved ploughs, improved seed drills, tractors and harvestors are necessary for increasing agricultural productivity. Improvement and sophistication of instruments is essential for progress. Science has, all through its history, been associated with special scientific apparatus which have been changing from time to time. We have been continuously improving thermometers, telescopes, microscopes and spectrometers and colour analysers. Besides ordinary microscopes of high magnification, we have now ultra-microscopes and electron-microscopes.

Remarkable changes have taken place in our heating methods. In the earlier part of the last century, scientists employed charcoal stoves. Then came the great invention of the Bunsen Burner. Various heating baths slowly came into common use and now we have very convenient heating mantles using electricity and with automatic controls. There has been a revolution in recent years in the production of glass apparatus. The heat resistant pyrex glass and quick-fit apparatus made of this glass have rendered chemical research ever so easy and convenient. Many improvements of this type and automations have removed the tadium of scientific experiments and research. Consequently, the pace of research can be faster, provided a scientist utilizes the time and the effort saved thereby usefully in thinking out and planning new experiments.

In pre-war years costly instruments were still comparatively few. Special ones had to be fitted up by the scientists requiring them. Construction of these constituted an important part of research but the position has changed rapidly. It is well known that in the post-war years instrumentation technology has developed to a remarkably high degree. Several large concerns have specialized in this industry. Many complicated instruments have been made available for research work in compact units which operate with speed and efficiency. Therefore, all the world over, use of such instruments is common and the data procured thereby have become quite essential for any research work. About twenty years ago, a chemical compound used to be characterized by its melting point, crystal structure and carbon and hydrogen analysis. These were considered to be enough for proving identity or difference, but now spectrometric methods have become more and more common and they have added to efficiency and accuracy. The earliest instrument of this type was the ultraviolet spectrophotometer. The original manual instruments required taking a number of readings followed by drawing out curves. Now the curves are more conveniently and directly recorded by modern machines. Somewhat later came the infra-red spectrophotometer. This makes studies and comparisons more precise because a larger number of points are made available for the purpose. More recently, a number of other methods using more complicated and costly instruments have been introduced. Among them is the Nuclear Magnetic Resonance Spectrometer which gives very useful information about the structure of chemical molecules. This records a large number of details about a compound corresponding to different structural features and is therefore a powerful instrument. Mass spectrometer is another useful instrument made available in recent years. Using a small amount of a compound it indicates not only its molecular weight, but also the pattern of its decomposition into smaller units. Further, chromatography including Gas Chromatography has added to our facilities.

All these useful instruments are highly costly running into lakhs of rupees. I should not forget mentioning here the extremely high cost of machines used in particle physics or space research where the figures run very high into crores of rupees. Besides cost, these instruments are made only in advanced western countries. Considerable foreign exchange is, therefore, needed for the purchase of these scientific instruments and it is essential to minimize our country's requirements by avoiding unnecessary duplication or multiplication of these in different institutions. It is an old and well known practice of scientists, students as well as teachers, to own simple instruments, for example, geometrical sets, weight boxes, botanical instruments, hand

lenses and pocket spectrometers. In recent years it has been extended to the possession of costlier instruments. Very often, large grants, specially made available, have been utilized for the purchase of equipment not immediately or urgently needed, on the expectation that they will be useful some time, and merely because money has to be spent. This has resulted in the multiplication of the same costly instruments sometimes within the same or nearby institutions.

Besides high cost of purchase there is serious difficulty of maintaining these specialized instruments. In olden days, the scientist used to open and repair his own apparatus, but, now the special instruments are so complicated that engineers especially trained in this work are necessary. They are few in our country. In many cases they come from distant places like U.S.A. and Switzerland. Their charges are extremely high. Spare parts are not easily available and technicians trained to operate these instruments are few.

All these serious difficulties can be avoided or at least minimised if we could organize instrument service centres in suitable locations in the country. This is not altogether a new idea; some countries have for a long time adopted it in practice. For example, in New Zealand, UK, USA and Germany, private individuals provide these services profitably. For our large country, four centres may ultimately be needed. By a process of pooling we could have the essential number and variety of these instruments in these centres and have sufficient number of technicians and engineers to look after them. Their service may be made available on minimum cost basis.

Some subvention may be given by the Government for setting up of the instrument service centres. This will help relieve the existing strain on the limited funds of the educational and research institutions. To begin with, one centre could be established in a location which has adequate facilities and others developed in course of time. An organization like the CSIR could take this up as an urgent item and use the expert services of their Central Instrumental Organization in this regard. An enthusiastic and capable organizer is needed at the beginning and he should have great faith in this work as a national service for the promotion of research.

It has been frequently stated that many instruments are lying idle in various institutions in the country for lack of maintenance and repairs. Some may not be in actual use and therefore suffer from neglect. An attempt could be made to collect them and utilize them after suitable repairs wherever necessary. Reasonable compensations could be given to institutions which surrender the unwanted equipment.

Pilot Plants: In applied research, pilot plants considerably increase the cost of research. In the laboratory we have been successful in working with semi-micro and micro quantities and even with a limited number of molecules. This has been possible because of the extremely sensitive instruments. It cuts down expense and time remarkably. On the other hand, in large scale factory operations, it is necessary to use larger quantities and with greater speed for reducing the costs of production. The gap between the two scales is therefore very large and the conditions for success in the two cases may be markedly different. Hence, there is imperative need to experiment with pilot plants of graded capacities. The scale of the pilot plant should be determined with financial prudence. There has been a tendency to instal factory scale plants in the research laboratories resulting in a large number of unwelcome consequences and problems.

Chemicals: Before the last war, practically all chemicals, crude as well as pure, and all solvents were imported into our country. During the war there was acute scarcity and prices were extremely high. Later, owing to rapid industrialization the position improved a good deal. Even then, special research chemicals are seriously in short supply and the lack of foreign exchange has made them almost unavailable. The situation requires urgent remedy. The CSIR has instituted two schemes, one in the National Chemical Laboratory, Poona, and another in the Chest Institute, Delhi University, for producing rare chemicals and biochemicals required by research laboratories. These supplies have to be considerably expanded in order to cope with the demand. A proposal was mooted some time back to start in India an institute for producing synthetic chemicals under the auspices of the National Science Foundation of the USA. It has not as yet progressed far enough to take a concrete shape.

Economy by Cooperation and Coordination: Modern scientific institutions should serve one or more of three important functions: (1) the advancement of science; (2) the communication of science; and (3) the application of science. They should maintain high standards. Universities should be capable of producing graduates of the highest quality, and a necessary condition for good teaching is the parallel provision for good fundamental research. Consequently, the Universities must serve the first two functions efficiently. Research pertaining to application is widely conducted in Government and industrial laboratories. In the interest of economy and efficiency it is desirable to establish close contacts between them and universities by developing what is called university complex. This is particularly important for developing countries which suffer from acute shortage of

financial resources and of competent scientists. National and industrial laboratories usually conduct problem-oriented research. Their experienced scientists will be able to communicate their expert knowledge to the growing generations of students by working as Honorary Professors. Further, their association with their colleagues in discipline oriented university laboratories will be a great advantage in keeping them in touch with new ideas and developments. University professors could act as consultants in the national and industrial laboratories. This association will, besides adding to the efficiency of men, help avoid considerably the duplication of equipment and library facilities. Unfortunately, adequate thought was not given to this idea in the past. The importance of coordination needs to be fully appreciated and put into practice. In starting new institutions, the out-sharing of facilities between the two types of laboratories should be kept in new.

Libraries: Information and Documentation Services: Books and journals are so important for the communication of knowledge that a university has some times been defined as a collection of books. With the large growth of scientific knowledge and disciplines the responsibility of science libraries has become extremely great and complex. It has become a serious problem to deal with the enormous number of books and journals that are currently being produced every year. Many libraries have not been prepared for this explosion in literature production and the cost involved taxes their resources heavily. The problem becomes more acute when active research schools are involved.

The first concern of a research worker, starting on a project, is to collect all information about the existing state of knowledge in that subject. This will be spread over a large number of journals and books that are published every year, their number ranging in thousands. Many abstracts and indexes are published and the computer is pressed into service for literature search. Most universities are too poor to buy the journals which have become in recent years very costly. For example, the Chemical Abstracts costs about Rupees ten thousand a year. The National Laboratories spend a good deal of foreign exchange in that each one of their purchases an almost complete range. Some rationalization will result in considerable economy. A national information and documentation service is a primary necessity. This should procure copies of publications of journal articles requested by research workers, should also draw the attention of research worker to literature likely to be useful to them and further provide translations of papers appearing in foreign languages. Quick supply of information is important particularly for industrial research and many well organized industries have their information services. But a pooled national service organization

in which the universities, the Government and the national laboratories participate, will mean added efficiency and economy. Such a service should be located in association with a good library and have all modern facilities of photostat and microfilms. This matter should receive the urgent attention of all science councils in our country and the U.G.C., because a sizable part of the science budget is involved and that too in foreign exchange.

Priorities for Investment of Finance : In his Presidential Address (November 1968) to the Royal Society, Professor (now Lord) Blackett has dealt with the question of priorities for developing countries. The occasion was the review of the report of the 'Royal Society Conference for Commonwealth Scientists' held in 1967. He urged that anybody who was actively concerned with the scientific development of underdeveloped and developing countries should look beyond science to the whole problem of development. In the conference it was agreed that the science which needed support was primarily applied science, as closely related as possible to the practical needs of the country. These practical needs will depend upon the state of the economy; for science to be of any practical use to the developing country, a certain degree of general economic and social development must have been reached. Lord Blackett placed special emphasis on three points. The first is the primacy of agriculture. The second is that the growth of agriculture needs the support of products of advancing industry such as transport, machinery, fertilizers and pesticides. The third point is that it is vital not to identify science only with research and the scientists only with research workers; far more engineers and scientists are needed in development, manufacturing and marketing. Consequently, a developing country should not put too many resources into basic research unrelated to practical needs. The mistake should not be made of following the practices of highly developed countries whose income per head is about fifteen times as much as that of India. These are important considerations, because wrong science policy in regard to financial outlay can easily impoverish a developing country rather than enrich it.

MACHINERY FOR FORMULATION AND OVER-SEEING OF IMPLEMENTATION OF NATIONAL SCIENCE POLICY

B. Sivaraman

THE Scientific Advisory Committee of the Cabinet was formed on 30th May, 1956 by a Resolution of Government. The functions were specified in the Resolution as follows:

(1) To advise the Cabinet:

- (*a*) in the formulation and implementation of the Government's scientific policy;
- (*b*) on the coordination of scientific work between the various Ministries of Government and between Government and semi-governmental and non-governmental scientific and technical institutions in the country, including the scientific and technical departments of the universities;
- (*c*) on scientific and technical cooperation with other countries and with international scientific and technical organisation; and
- (*d*) on such matters as may be referred to it.

(2) To place before the Cabinet such proposals and advice as may improve and develop scientific and technical work in the country.

The Committee comprised of the top scientists in several fields of science. The Secretary General of the Ministry of External Affairs was the first Chairman of the Committee. Later, the Cabinet Secretary and, thereafter, Dr. Homi Bhabha, Atomic Scientist, chaired the Committee. After the death of Dr. Bhabha, the chairmanship of the Committee again went to the Cabinet Secretary. The Committee was serviced by the Cabinet Secretariat.

The Scientific Policy Resolution was declared by Government on 4th March, 1958. The effective portion of the Resolution is contained in paragraph 7 of the Resolution which runs as follows:

"The Government of India have accordingly decided that the aims

of their scientific policy will be:

(*i*) to foster, promote, and sustain, by all appropriate means, the cultivation of science, and scientific research in all its aspects—pure, applied, and educational;

(*ii*) to ensure an adequate supply, within the country, of research scientists of the highest quality, and to recognize their work as an important component of the strength of the nation;

(*iii*) to encourage, and initiate, with all possible speed, programmes for the training of scientific and technical personnel, on a scale adequate to fulfil the country's needs in science and education, agriculture and industry, and defence;

(*iv*) to ensure that the creative talent of men and women is encouraged and finds full scope in scientific activity;

(*v*) to encourage individual initiative for the acquisition and dissemination of knowledge, and for the discovery of new knowledge, in an atmosphere of academic freedom; and,

(*vi*) in general, to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.

The Government of India have decided to pursue and accomplish these aims by offering good conditions of service to scientists and according them an honoured position, by associating scientists with the formulation of policies, and by taking such other measures as may be deemed necessary from time to time.

It will be noticed that the Scientific Advisory Committee of the Cabinet (SACC) was formed before a clear and Comprehnsive scientific policy was laid down by Government. The Committee by its terms of reference had already the authority to oversee the implementation of the Scientific Policy Resolution. It will also be noticed that the SACC had a very comprehensive franchise. In fact, the entire field of science was for it to consider and advise the Government. The Scientific Policy Resolution set out the objectives of Government in developing science. It was obviously the task of the SACC to advise how best the objectives could be achieved. Several organizations and institutions and universities were already dealing with scientific research and development. It was not, therefore, planning in a vacuum. The existing scientific institutions had to be pursuaded to accept the new dimensions of the scientific policy and the methods which the

Government might consider most suitable for scientific advancement of the country.

SACC took up, as one of its various tasks, the examination of the organization of the institutes and laboratories to see how far they were in a position to deliver the goods. Independence of scientific thought and decentralization of power to enable a scientist to work with sufficient freedom in his allotted task were the basic principles enumerated by the SACC. Because of the weakness of the secretariat of the SACC, it took a long time to evolve the principles. It may be useful to recapitulate here the time-scale of this operation to arrive at a consensus on the model constitution for the scientific institutions. As early as 21st March, 1960, SACC considered this problem and ordered case studies. On 8th April, 1960, the Director of Organization & Methods was requested to do case studies of seven organizations to enable SACC to consider the problem. On 27th January, 1961, reports on the Indian Council of Medical Research and the Indian Cancer Research Centre were brought up and considered in two subsequent meetings on 23rd March, 1961 and 16th May, 1961. Though certain views were taken, they were not to be communicated till all the reports on the institutions were received and a final view taken. The Director, Organization & Methods, was requested to draw up model bye-laws on the basis of this investigation. Draft bye-laws were brought up on 18th January, 1963 and sent back for a concise statement of general principles. A draft model constitution for scientific institutions was approved at a meeting on 8th October, 1963 and the final draft issued on 4th February, 1964. Steps were then taken by the Cabinet Secretariat to get orders of Government on the model constitution. Government approved the same and this was communicated to scientific institutions and organizations for adoption with such modifications as were necessary to suit their individual needs keeping the broad principles intact. A recent check has revealed that many institutions have yet to follow the norms laid down!

Another important problem the SACC considered was the provision of suitable scales of pay and suitable working conditions to scientists. Initially the scales in the CSIR laboratories were suitably fixed. Following this, general principles of scales of pay for different levels of scientists and for Directors of institutes were approved by Government on the advice of the SACC. The scales are comparable to those available in other disciplines. It is sometimes felt that SACC devoted too much time and attention to the problems of scales of pay and working conditions. But from the experience and the time taken to get reasonable principles accepted by all concerned and the necessity

of having a contented scientific service, it cannot be said that the interest shown in this problem by the SACC was out of proportion.

The SACC also tried to take up the examination of the working of scientific organizations and survey organizations. Individual members were requested to prepare base papers which were to be discussed in the Committee. As individual members were also busy scientists not much grist came to the mill. Probably realising that this important work was not receiving sufficient attention, Government appointed in April, 1963 a Committee on Organization of Scientific Research (COSR) with the following functions:

"(*a*) To examine and report on the scientific work being done in the country.

(*b*) To indicate the steps that should be taken to enable the work to be carried on effectively, consistent with such economies as might be possible."

This Committee which also comprised very busy scientists went into the working of two institutions only, namely, the Indian Meteorological Department and the Civil Aviation Department and came up with reports. These studies have highlighted the basic weaknesses of the organizations which have to be corrected before we can get full value out of the large expenditure incurred by Government. After the Committee on Science & Technology was formed, two more items, namely, the Geological Survey of India and the Survey of India have been taken up for detailed study. Areas of duplication and dual responsibilities have been identified and organizational weaknesses pin-pointed. It is now apparent that detailed studies of this nature have to be carried out in most of our survey and research organizations to streamline the working.

There is another sector of scientific activity where Government have appointed a separate Committee to go in depth into the problems. In August, 1963, a Committee was appointed under the chairmanship of Dr. Homi Bhabha to study the problem of electronics. This Committee studied in depth the requirements of electronics development in the country and forecast the probable magnitude of requirements in the various sectors. The Committee also appraised the capacity of the country to produce its own requirements and suggested the means of doing so. The Committee's report was with Government in 1966. An Electronics Committee, under the chairmanship of Dr. Vikram A. Sarabhai, has been appointed with the following functions

to implement the recommendations of the Bhabha Committee:

> "The Committee would take account of the most urgent needs for the rapid development of electronics, keep track of the research being done in design and development, identify the sectors where indigenous production could be built up, and promote the speedy building up of the capacity."

The Committee is serviced by the Department of Defence Supplies.

In 1968, the SACC was replaced by the Committee on Science & Technology. The functions of the new Committee is an enlargement of the functions of the SACC into the field of technology. The functions are:

"The Committee will advise Government

(*i*) on the formulation and implementation of Government's policy on science and technology and determination of national priorities in these areas;

(*ii*) on the pace of development of scientific research and technology suggesting measures for correcting imbalances wherever necessary;

(*iii*) on coordination, cooperation and communication between Ministries of Government and between Government, semi-government and non-government scientific and technological institutions in the country;

(*iv*) on the development and full utilization of the nation's scientific and technological resources and measures for ensuring a proper balance between these indigenous resources and purchase of foreign technology consistent with needs of national development;

(*v*) on scientific and technological cooperation with other countries and with international scientific and technological organizations; and

(*vi*) on any other matter that may be referred to it by Government."

The Committee has on it not only scientists but an Economist and a Statistician.

What was the status of the SACC (now constituted as COST) in getting Government orders on problems and in enforcing the orders?

As has already been pointed out, the SACC was concentrating on problems of status of the scientist and his remuneration and working conditions. Studies in depth of scientific problems and scientific organization were not attempted except through the COSR and the Electronics Committee. Being an Advisory Committee of the Cabinet, its recommendations were directly placed before the Cabinet for a decision. As long as the problem was one of general purport and no inter-departmental friction was involved, there was no difficulty in getting the considered recommendations of the Committee accepted by Government. However, when inter-Departmental disagreement arose, the machinery was not strong enough to get a decision quickly. As an example, in the meeting on 27th January, 1961, the Committee felt that a separate Science Press which can print scientific material quickly was necessary. In the meeting on 19th March, 1963, it was requested that the matter be placed before the Cabinet. The Works & Housing Ministry was opposed to the resolution. Long after, it was found that the matter had not progressed. This was a case where the Committee did not consult the relevant Ministry before taking a decision. Later, as a regular practice, when the interests of various Ministries were involved, their representatives were invited to the meeting of the Committee and their views heard before a decision was taken. Whether this method will stand scrutiny where Ministries strongly differ from the views of the Committee is yet to be seen. The difficulty can be remedied if, before a problem is decided by the Committee, the pros and cons are stated in a detailed paper and the views of the concerned Ministries are incorporated in it. The matter then goes up to the Cabinet like the recommendation of any Ministry of the Government but with a wider franchise. The Cabinet can then decide on the basis of complete facts before it. This method would, however, require a strong Secretariat.

Till 1967, the SACC was serviced by the Cabinet Secretariat. But there was no separate officer in full charge of this work. It was done by the various officers of the Cabinet Secretariat as a part of their servicing of different Committees. It was realized that this Secretariat was not well equipped to study various scientific problems and prepare detailed papers for the Committee. Papers were usually brought up by individual members. These being busy scientists with other avocations, the papers brought up were only a few. As far back as the meeting on 4th January, 1960, it was proposed that a scientist should be brought in as the Secretary to the Committee. It was, however, not until the meeting of 1st August, 1967, that the matter was re-opened and it was suggested that six scientists should be inducted into the Secretariat of the Committee to service various disciplines of science. It was decided at this

meeting that a start be made with one scientist and one Economist. Even this proposal was objected to by one of the members in the meeting on 6th November, 1967. Finally, a scientist was appointed in March, 1968, as Secretary to the Committee with a small cell to service the Committee. This cell is located in the Cabinet Secretariat. After COST was constituted early this year, proposals have been approved for a stronger secretariat with several scientists in charge. The process of selection is going on.

The most important task which was assigned to the SACC and which is now the responsibility of the COST is to advise Government on the formulation of the science policy. So far neither body has gone into the problem of modifying the Science Policy Resolution of 1968 to suit the changed requirements. A careful perusal of the Science Policy Resolution, 1958, will show that the emphasis then was on freedom of the individual scientist to use this genius for development of science. The Resolution implied that he should be given the opportunity and freedom to work as he likes. The Resolution also said that the results of scientists' discoveries should be available to the people for use. Experience has shown that in the modern world science develops where the scientists get together to solve problems. Problems are multidisciplined and specialisation is more and more in narrower fields. Team work is the basis of all modern science. Secondly, resources of the developing countries are limited. Priorities are many. Accordingly, people often question the wisdom of allowing scientists free scope to do what they like. There is a growing demand that priorities must be laid down for scientific research and quicker action should be taken to translate scientific findings into fields which will benefit the people of the country. Government have also laid emphasis on the greater involvement of the National Laboratories of the CSIR in applied research which will directly aid and benefit industrial development. While the Scientific Policy Resolution of 1958, as a statement of broad aims, is unexceptionable, the decisions of policy on the areas of scientific effort that will be most beneficial to economic and industrial development and the organization of scientific effort on a more cooperative basis will require appropriate reformulation of the Scientific Policy Resolution to fit in with the current circumstances.

One of the cardinal principles laid down by the Scientific Policy Resolution is the necessity to encourage individual initiative for the acquisition and dissemination of knowledge and for the discovery of new knowledge in an atmosphere of academic freedom. Obviously this emphasises the need for encouragement of scientific research in our universities. These are institutions where academic freedom is expected

to be practised. Besides, it is generally accepted that universities are the proper places for encouraging and developing fundamental research in science. What is the present position about support to research in science in our universities? Ninty-five to ninty-six per cent of the expenditure on research and development in this country is contributed by Government. Out of this, the four major national institutions, namely, the Council of Scientific and Agricultural Research, Department of Atomic Energy, Indian Council of Agriculture Research, and the Defence Research and Development Organisation take away 68 per cent. The universities which are funded by the University Grants Commission get very meagre allocations for scientific research, because of paucity of funds at the disposal of the University Grants Commission. It has been agreed that in the Fourth Plan that the University Grants Commission must be supplied with a certain level of funds for encouraging scientific research in the universities. The question naturally arises, "Where will this money come from?" If, in the Plan outlays the nation has set apart in the Government sector a certain amount of funds to encourage scientific research of different types, the problem of fairly dividing this sum between the three basic sectors, namely, pure, applied, and educational, has still to be resolved. Any decision in the matter will have to be based on assessment of capacities and priorities. It is accepted that the national institutions should support applied research, particularly that which is required by industries, considering the paucity of high level scientists in the country, it is obvious that the universities, which have within their fold quite a number of high-level scientists, should specialise more in pure research and educational sectors. This is undoubtedly an important issue on which the considered views of the SACC, and now of the COST, would have been valuable. This work has yet to be done.

Another objective of the Scientific Policy Resolution was to ensure adequate supply, within the country, of research scientists of the highest quality and to recognize their work as an important component of the strength of the nation. From time to time, SACC considered the problem of constituting a separate service for scientific research in the country. As various institutions and universities had been given substantial autonomy in selection and promotion of their personnel, the problem of horizontal and vertical movement of personnel between laboratories doing similar work was a serious one. One of the suggestions put forward was the creation of a Scientific Service in particular disciplines like the Indian Agricultural Research Service. In the meeting on 30th May, 1964, the Committee agreed that the constitution of a service by lumping together various types of scientific posts would go against the basic principles of the management of scientific institutions.

It would also raise the problem of institutional autonomy. In its meeting of 6th December, 1965, the SACC noted with approval the practice followed by the Council of Scientific and Industrial Research method of taking over scientists from other institutions without loss or interruption of the previous service benefit. This matter did not receive any final shape till the COST took over. COST has now suggested developing of horizontal and vertical mobility of workers amongst the scientific institutions, universities and Government by allowing the personnel to carry the service benefits from one institution to another as a general rule. This proposal is yet to be accepted.

Another problem that received the attention of the SACC was of bringing back to the country good scientific workers of Indian origin working in foreign laboratories. A Scientists' Pool was the outcome of this consideration. Though it was agreed that the Pool should have posts at various levels of pay, it was found recently by the COST that posts were created only at the lowest level. As a result eminent scientists were not tempted to come back to the country. The above scheme was supplemented by the creation of supernumerary appointments by providing for an overflow of about 10 per cent in the budget. However, an examination of the scheme by the COST has revealed that even this agreement has now worked satisfactorily. One of the reasons for it is the lack of flexibility in the system of recruitment and fixation of pay.

The Scientific Policy Resolution lays down that it is the objective to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge. It was the responsibility of the SACC to advise the Government on how best this could be done. It has been noticed that the volume of production developed through the discoveries in the National Laboratories under the CSIR is not very significant considering the expenditure on the research. It is recognized that there are sectors of research where the laboratory scale discoveries have to be translated into pilot plant studies before the results can be accepted by industrial entrepreneurs. The National Research Development Corporation was formed in 1953 to perform this vital function. In spite of the efforts put in by the NRDC, in several cases, the pilot plant studies are not comprehensive enough and many results are probably still in the laboratory scale stage and not of direct utility to industry. What are the needs of this sector? A laboratory-scale development does not allow for a proper economic appreciation of the potential of the scientific discovery. It is only when the process is put through a pilot plant that one can get a rough idea of the investments involved and the commercial economics of the process. It may happen that when a laboratory-scale process is

translated into a pilot plant study, it is found that the process may not be commercially viable. The development expenditure then becomes infructuous. When the pilot plant study is successful, even then the development expenditure will not be recouped unless there is an entrepreneur willing to go into production and willing to incur the development expenditure. There may be security needs which require that a process shall be developed in key sectors even if the cost is high. In some processes the development cost is out of proportion to the volume of the product in the bulk required, especially in Defence and other security fields. There are some processes which on the face of it, appear to have potential and the entrepreneurs may be willing to invest in the pilot plant study in return for monopoly of the process. The acceptance of such methods will normally benefit only the very large entrepreneurs. If the medium-level and small-level entrepreneurs have to benefit from the scientific research, it may be necessary for Government sponsored organizations to undertake the pilot plant studies and give the know-how to all who want it at reasonable rates of royalty. Scientific discoveries are a continuing process. There has to be a machinery which can do the various pilot plant studies or authorise various institutions to carry out the pilot plant studies necessary. All this would require a large investment of funds. In the formulations so far made, there is not much allocation for this basic development expenditure. The needs have not been assessed or quantified and presented to the planner for a decision. COST has already taken a preliminary look at the problem and initiated studies to advise the planners in some areas.

A cursory reading of the Scientific Policy Resolution may leave the impression that what is being supported is absolute freedom of research to every scientist without any trammels. This is the duty of the State to give him the needed facilities. In fact, various scientific bodies have been claiming a freedom to do what they like and also claim that the state should set apart a fraction of the gross national product for this purpose. The charter of the SACC may have also lent further support to this attitude because all that it was called to do was research and maintenance of coordination between all those engaged in scientific research. Control over the scientist in the selection of programmes for work or to follow national priorities were not clearly spelt out in its terms of reference. This lacuna has been made up in the franchise of the COST. The COST has been given the duty to advise the Government in determination of national priorities and suggesting steps to correct imbalances, wherever necessary. This meets the growing demand that there should be some mechanism to oversee that the work of the scientist should have relation to the nation's requirements and

priorities are set and be observed. Even now there are scientists who do not appear to appreciate the need for such self-control, but these are on the losing side. It is now accepted that the country must get full value for the money spent on research and development. Scientists can no longer work in isolation, but must evolve a team spirit to solve the nation's problems. Research should be purposeful. Freedom of the scientist can mean only freedom in the adoption of scientific method in the task allotted to him. Team work has to be built in by hard discipline. Where team work has been introduced as in the Atomic Energy Commission, Defence Research & Development Organisation and the Indian Council of Agricultural Research, the results have been spectacular. Allocation of tasks to universities, institutions and individuals must be on the basis of national priorities and national requirements. COST will now have to take up its legitimate task of advising Government on national priorities and correction of imbalances. This is quite a difficult and complex problem which deserves early action.

We have been trying to analyse the machinery that is available for the implementation of the Science Policy Resolution. From the facts that have been brought out, it is evident that what we have got is a machinery *to advise* the Government on the measures necessary to implement the Scientific Policy Resolution. This machinery was till recently the SACC and it is now the COST. Government have also used the COST and the Electronics Committee to examine and advise them on definite sectors of scientific research. The analysis so far made shows that even in the matter of advising Government about the measures necessary to implement the Scientific Policy Resolution, because of the weakness of the structure, these organizations have not been able, over the last 13 years, to cover much of the crucial sectors of the Scientific Policy Resolution. As regards implementation, the present system is that after Government orders are passed, it is for the relevant Ministries to carry out the decisions. There is at present no mechanism to follow up the recommendations to see whether the orders have in fact been carried out by all concerned. For example, the order about the model constitution for the scientific institutions has yet to be implemented by many of the institutions. If the COST is to do the work on behalf of Government and bring up laches to the notice of Government, obviously its structure will have to be suitably adapted. The COST Secretariat, as has been explained above, is yet to be developed.

The machinery for the implementation of the science policy of Government was started 13 years ago. As we have seen, this

machinery is far from perfect. The charters of the SACC and the COST have been very wide and comprehensive. The SACC comprised some of the top scientists of the country and the COST in addition includes an economist and a statistician. All its members are top men in their lines. A Committee of such busy and eminent scientists can meet only occasionally. SACC met 51 times during nearly 12 years of its life. The problems of implementation of the science policy are intricate and range over a vast number of institutions, universities and State Governments. Before any improvement in regard to the coordination of their work and better planning and implementation of research they are doing can be suggested, the weaknesses in the existing structure and working of these bodies would have to be docketed. What was the method adopted for this? Throughout its life, the SACC followed the method of its members raising problems by bringing up papers. However, sincere and active a member may be, before he can bring up any suggestion of value in the matter of improvement of existing systems, he would have first to visit a large number of institutions and collect a large mass of data. The nature of the membership of the SACC made this absolutely impossible. Each of the members had a vast administrative field to control in addition to his working in his own scientific field. SACC noted this basic weakness in January 1960, but concrete proposals to meet it were made only in August 1967. The obvious remedy is to have a system of feeding the COST with detailed studies by a competent organization so that the experience and knowledge of the members of the Committee can be brought to bear on the problems stated and the facts analyzed. Here, one method would be to have a strong secretariat which can collect data and prepare the base papers.

The other is the Sub-Committee method. Probably, a combination of the two would have been the most useful. The Secretariat has to be mostly of persons of the middle and lower levels of scientific competence. A capacity to identify the sources and understand the basic structure of the relevant science is enough for a competent handling of the data collected and its collation. But such a worker cannot possibly go into the intricacies of the problem and suggest various remedies for the consideration of the main Committee. A Sub-Committee of middle or top level scientists in the relevant disciplines can, with some help from the Secretariat, formulate the lines of the study and the collection of data and also propose suitable solutions and remedies. A Sub-Committee can collect people from a larger range of institutes and universities dealing with the science in question and thereby provide a wider view of the discipline. Sub-Committees again have the same weakness as the main Committee that there will be no continuity

of action and somebody must keep them to the problems and ask for a purposeful pursuit of the problem for an answer. In this connection it may be worthwhile to take note of the organization built by the CSIR and ICAR to meet this problem. These two institutions have Sub-Committees for the various broad disciplines. The organization of the Director-General, in each case, provided for continuity and also poses problems for the consideration of the Sub-Committees. The organization also sponsors and supports coordinated research schemes in various institutes in the country. The top body in the country in science, namely,the COST, must have at least this amount of organization if it is to be effective in a field which includes the mammoth organizations like the CSIR, ICAR, Department of Atomic Energy, and the Defence Research & Development Organization. It will need lots more Sub-Committees than either ICAR or CSIR. Till all this organization is built up, the COST can only limp along, dealing with such segments of problems as can be handled by its small secretariat and by its individual members during the limited time they can spare its members for detailed work on behalf of the Committee.

Had the problems been only those of coordination at the top and lying down broad policies for adoption, much detailed work as to what is happening now in the institutions and universities may not be very relevant. Implementation means looking into the structure that is implementing the policy and suggesting remedies to weaknesses, if any, in the structure. If the basic structure is not yet oriented towards the national policy, the task of any top-level Committee becomes difficult and complex. What is the present position in our institutions and universities? Raw materials inventory of the country is the responsibility of various survey organizations. A study by COSR of two of scientific departments and the study now being made of two survey organizations have thrown up basic weaknesses in the structure and duplication and a lack of identification of responsibility for performance. In the research field, doubts have arisen whether our institutions are suitably staffed with the type of scientists who can solve quickly the national problems of industrial growth and import substitution. The problem of harnessing the laboratory results to actual use still remains largely unresolved. If, therefore, the COST has to discharge its responsibilities, it needs a comprehensive organization which can deliver the goods.

Whatever advice the COST may give after detailed study of a problem, the machinery which would follow up on its implementation has yet to be built up. At one time there was a Ministry of Natural Resources and Scientific Research. It later became the Ministry of Scientific

Research and Cultural Relations. It is obvious that some organization at the Ministry level has to be given the specific duty of implementation of the recommendations of the COST as are accepted by Government. It was expected that the Cabinet Secretariat should help in implementation. If it is to do so, then an organization in the Cabinet Secretariat has to be built up for the purpose.

Summing up, the machinery for implementation of the scientific policy of Government is at present only in bits and pieces. The machinery has to be properly developed and set moving. Only after there is some semblance of system, we shall be in a position to think in concrete terms about speedier and more coordinated implementation of science policy of the Government.

NEHRU AND SCIENCE: THE VISION OF NEW INDIA*

Ward Morehouse

" . . . in every direction and in every department of life," Jawaharlal Nehru, the late Prime Minister, once stated, "science has revolutionized the world. This march of science is continuing even now, and it seems to rush on faster than ever . . . . The future belongs to science and to those who make friends with science."[1]

And so indeed was Nehru convinced, as the public record of his leadership of both the nationalist movement and independent India until his death in May, 1964, amply indicates, that "the future belongs to science" and that India must therefore develop its own scientific capability as rapidly and effectively as possible. But in this, as in so many other aspects of government and science in India—and in a still wider sense virtually all human events of vital public significance—we are confronted with the proverbial problem of the iceburg, conventionally estimated to be one-seventh above the water with the remainder of its bulk obscured beneath the surface. Because so much is still obscured beneath the surface in government files and correspondence and in the minds and memories of those directly involved with him in reaching many crucial decisions in this field, difficulties of assessing Nehru's role with respect to the development of modern science in India, particularly since Independence abound. Yet any consideration of the character and consequences of governmental encouragement of scientific work in India cannot overlook the vital role played by the late Prime Minister. What follows is necessarily a preliminary assessment, subject to refinement—and indeed—revision as more of the iceburg comes into view and as our understanding of these complex human affairs are increased by additional perspectives gained through the passage of time.

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*I am indebted to B. R. Nanda of the Nehru Memorial Museum and Library, B. V. Subbarayappa of the National Institute of Sciences of India, Donald Smith of the University of Pennsylvania, R. Maru of the Centre for the Study of Developing Societies, and Brijen Gupta of the City University of New York for reading the manuscript for this article and given me the benefit of their critical comments. Needless to say, I alone am responsible for the views expressed here.

[1] As quoted in Nehru Commemoration Number, *Science Reporter*, July-August, 1964 (Vol. 1, Nos. 7-8), pp. i, 47.

II

The antecedents to the course of action followed by independent India in strengthening scientific work in the country lay as much as anywhere else in the work of the National Planning Committee of the Indian National Congress which was established in 1938 with Nehru as its chairman. It appears that it was in substantial measure Nehru's personal commitment to and enthusiasm for this undertaking which carried it along—commitment and enthusiasm not actively shared by many of his colleagues who were leaders in the struggle for Independence. Gandhi at one point suggested to him that "much money and labour are being wasted on an effort which will bring forth little or no future".[2] The essence of the conclusions of the National Planning Committee and of Nehru's views on the course of economic development for India after Independence were that India, with scarce resources, must plan the use of these resources, that such planned development must include industrial and agricultural development based on modern technology, and that modern technology required an active and self-generating scientific tradition in the country.

Nehru's own interest in science goes back at least to his days as a university student in England where he studied at Trinity College in Cambridge and took the natural science tripos in chemistry, geology, and botany. This provided him with opportunity for some contact with the Cavendish Laboratory, where many of the leading British scientists in the late 19th and early 20th century worked—men such as James Jeans, Arthur Eddington, J. J. Thomson, and Lord Rutherford. While he left active scientific studies when he left Cambridge in 1910 for studies in the law at the Inner Temple and for almost four decades of political activism in India's freedom struggle, his university studies of science, along with other fundamental intellectual dispositions which we shall explore further in considering different aspects of his own thought as they bear upon the role of science in modern Indian society, clearly left a strong commitment to science as an important means of solving man's problems.

Throughout the 1920's and 1930's, as his involvement in the freedom movement intensified and as his recognition as one of the principal leaders of this movement grew, he was continually preoccupied with a host of immediate political concerns, interspersed by jail sentences. But even during this period, when his own political, economic, and social ideas were beginning to take more clearly defined form, he

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[2] Jawaharlal Nehru, *A Bunch of Old Letters*, New York : Asia Publishing House, 1960, p. 379.

continued to ponder the fundamental impact of science on the modern world and its implications for the Indian scene. "I want to increase the wealth of India and the standards of living of the Indian people," he wrote in 1934, "and it seems to me that this can only be done by the application of science to industry, resulting in large-scale industrialization."[3]

The next four years were ones of great personal trial for Nehru, with the death of his wife in 1936. He spent much of this period either in jail in India or outside of India, particularly in Europe. But at the end of 1938, when he returned from a second trip to Europe, he became immersed in activities in India again. He stayed somewhat apart from the leadership of the Congress at first, and according to his own assessment of his major preoccupations at the time, the chairmanship of a National Planning Committee which was established under Congress auspices was one of two major activities claiming his attention. It was perhaps here that Nehru's commitment to the importance of science as an instrument of economic and social transformation began to take concrete form in terms of priorities of government action.[4]

A few years later, writing about the work of the National Planning Committee, he observed that:

> The three fundamental requirements of India, if she is to develop industrially and otherwise, are: a heavy engineering and machine-making industry, scientific research institutes, and electric power. These must be the foundations of all planning, and the National Planning Committee laid the greatest emphasis on them.[5]

Nehru recognized, of course, that the work of the National Planning Committee was somewhat academic. And as we have noted, his great enthusiasm for it was by no means shared by some of his other colleagues in the freedom movement, particularly Gandhi. But Nehru continued his active role, undeterred by such reservations. "For me this has been fascinating work," he wrote in his *Autobiography*, "and I have learned much from it. It is clear that any scheme that we may produce can only be given effect to in a free India. It is also clear that any effective planning must involve a socialization of the economic structure."[6]

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[3] Nehru, *Recent Essays and Writings*, Allahabad : Kitabistan, 1934, p. 36.

[4] Nehru, *Toward Freedom* : *The Autobiography of Jawaharlal Nehru*, Boston : Beacon Press, 1958 (originally published 1941), p. 366.

[5] Nehru, *The Discovery of India*, New York : John Day, 1946, p. 416, as quoted in Borothy Norman, ed., *Nehru* : *The First Sixty Years*, New York : John Day, Vol. 2, p. 148.

[6] Nehru, *Toward Freedom, op. cit.*, p. 367.

For the next decade, Nehru was either in prison—where he spent a good part of the Second World War—or totally immersed in the freedom movement which culminated in the achievement of Indian Independence on August 15, 1947. Independence brought to the subcontinent at least as many problems as it resolved, with all of the melancholy consequences of partition of the subcontinent into India and Pakistan, and throughout this period, Nehru was heavily engrossed with extraordinarily demanding responsibilities as the first Prime Minister of free India. But he never lost sight of the vital importance of economic and social transformation of Indian society, a transformation which he was convinced depended upon bold and imaginative planning and the widespread introduction of modern technology, which in turn required rapid development of the country's scientific capabilities.

The National Planning Committee might in many ways be regarded as the predecessor of the Planning Commission which was established in March, 1950. The resolution establishing the Commission referred to the Constitution of India and particularly to some of the "Directive Principles of State Policy" in the Constitution concerned with the economic and social welfare of the people. The resolution stated that the functions of the Planning Commission were, among others, to make "an assessment of the material, capital and human resources of the country, including technical personnel, and investigate the possibility of augmenting such of these resources as are found to be deficient in relation to the nation's requirements."[7]

What is important in trying to assess Nehru's contribution to the development of India's scientific capabilities in the sequence of events leading to the establishment of the Planning Commission is that throughout the long gestation period, going back at least as far as the establishment of the National Planning Committee under the Indian National Congress in the 1930's, it was in significant measure Nehru's own personal interest—and his sense of economic and social priorities notwithstanding the political exigencies of the freedom movement and the early years of Independence—which resulted in decisive action in this field. Many of his colleagues in the freedom movement and within the independent Government of India in both the secretariat and the political leadership did not share Nehru's enthusiasm for what planning India's economic and social advance meant to Nehru. Nehru was by no means totally alone in his commitment to the importance of these matters, but there does seem to be little doubt that he

[7] Planning Commission Resolution as quoted in H. K. Paranjape, *The Planning Commission: A Descriptive Account*, New Delhi: Indian Institute of Public Administration, 1964, p. 11.

provided crucial elements of initiative and political leadership throughout the period leading up to the establishment of the Planning Commission, and in fact, after its establishment (he remained Chairman of the Commission from its inception in March, 1950 until his death in May, 1964.)[8]

To Nehru, planning was very intimately associated with science. Nehru fully realized, according to Professor Mahalanobis, the eminent Indian statistician long associated with Nehru in the work of the Planning Commission and scientific matter generally, "that continuing economic and national development in India would be possible only through the advancement of science and technology".[9] Perhaps this is why Nehru concluded that it was necessary to involve senior scientists and technologists in the working of the Commission. From 1954 Professor Mahalanobis was closely associated with the Commission, and in January, 1955, he became a *de facto* member of the Commission. There have been since May of 1955, when Dr. J. C. Ghosh was appointed, at least one other member of the Commission with scientific or technological background (except for a brief period in 1959) and sometimes two. This is substantial representation on a body, the total membership of which—including both full-time members and ministers with other portfolios such as finance who participated in the deliberations of the Commission—has ranged from 6 to 10 members.[10]

III

But the Planning Commission, significant as it was to Nehru in providing an instrument to help bring about the economic and social transformation of Indian society based on modern science and technology was by no means the end of his involvement in scientific activities. From 1947 through 1950, in addition to being Prime Minister and Minister of External Affairs, he was the minister in charge of Scientific Research, although he relinquished this portfolio in 1951 when the Ministry of Natural Resources and Scientific Research was established. This, of course, meant that he was responsible for presenting and defending the budget demands for scientific research in the Parliament and in other ways looking after the concerns of these areas of governmental activity and interest.

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[8] Paranjape, *ibid.*, p. 167; P. C. Mahalanobis, "Heralding a New Epoch", in Mahalanobis, *Talks on Planning* (Studies Relating to Planning for National Development No. 6) Calcutta : Indian Statistical Institute, 1961, pp. 9-10. Professor Mahalanobis, in this essay, gives an illuminating personal memoir on Nehru's role in planning and his relationship with the Prime Minister.

[9] Mahalanobis, *ibid.*, p. 25

[10] Mahalanobis, *ibid.*, p. 19; Paranjape, *op. cit.*, pp. 167-175.

Throughout his period as Prime Minister until his death in 1964, the parliamentary debates are littered with his responses to questions regarding scientific matters and institutions. His spirited advocacy of the importance of science to India's future development is likewise to be found in the annual debates on motions to grant funds for different scientific purposes. He also played a role in the Indian Parliamentary and Scientific Committee, serving as its President and participating whenever he could in its meetings because he felt it so critically important that members of Parliament and others in responsible positions in public life should understand as fully as possible the implications for public policy of new advances in scientific knowledge and techniques.[11]

Even after he relinquished the portfolio of scientific research in the early 1950's, he continued to serve as President of the Governing Council of the Council of Scientific and Industrial Research, indeed presiding over a meeting of the Council in March, 1964, only shortly before his death. One dimension of this involvement was his participation in the inauguration of virtually every national laboratory or research institute established under the auspices of CSIR.[12]

He was at least as intimately, and perhaps more so, identified with work in atomic energy in India. From the time the Department of Atomic Energy was established within the Government of India in 1954 until his death, that Department remained directly in his charge as Prime Minister (as indeed it does to this day). Just as he had a close personal relationship with Professor Mahalanobis and Dr. S. S. Bhatnagar, the first Director-General of the Council of Scientific and Industrial Research, so did he also with Homi Bhabha, Chairman of India's Atomic Energy Commission and Secretary of the Department of Atomic Energy from its establishment until his untimely death in an aeroplane accident in January, 1966. In fact, for some periods, Dr. Bhabha would appear on Nehru's appointment schedule for tea, dinner, or some other comparable occasion as often as every two weeks—far more frequently than would be necessitated by their official relationship and in spite of the fact that Dr. Bhabha was based in Bombay, not Delhi.[13]

Nehru's commitment to India's programme in atomic energy was a substantial one, sometimes to the concern, if not dismay, of those

[11] *Science Reporter*, July-August, 1964, *op. cit.*, p. 87; Nehru, *Speeches*, Delhi: Publications Division, Ministry of Information and Broadcasting, Vol. 2, p. 367.

[12] *Science Reporter*, *ibid.*, pp. 10, 69-70.

[13] Homi J. Bhabha, "Jawaharlal Nehru and Science", in Nehru Commemoration Number, *Science Reporter*, *ibid.*, pp. 24-27; interview by the author with a staff member of the Council on Scientific and Industrial Research (CSIR), New Delhi, March, 1967.

involved in other sectors of scientific activity who felt they were being neglected in order that the Department of Atomic Energy would be more adequately nourished. "I may inform the House", Nehru himself once said in a Lok Sabha debate on the atomic energy budget, "that nobody in the Government of India, anxious as we are to economize and save money, has ever refused any urgent demand of the Department or come in the way of its development for financial reasons." And he went on to say, in explaining why he was directly concerned with the work of this department.

> But we realize completely the importance of this work in the present and in the future. This is really why it is usual in India and in some other countries for the Prime Minister to be in charge of it. Not that the Prime Minister of India or any other Prime Minister is supposed to be peculiarly brilliant or especially suited for that purpose. The Prime Minister's being in charge merely shows how much importance has been given to work on atomic energy[14].

Still another aspect of Nehru's relationship to science in India—this time outside the scope of his governmental responsibilities—is the Indian Science Congress. "Though I have long been a slave driven in the Chariot of Indian Politics, with little leisure for other thoughts, my mind has often wandered to the days when as a student I haunted the laboratories of that home of science, Cambridge," he observed in a special message to the Silver Jubilee Session of the Indian Science Congress in 1938. "Politics led me to economics and this led me inevitably to science and the scientific approach to all our problems and to life itself." He took this occasion to declare himself in favour of some kind of governmental organization for research, although he did not attempt to define its character, and to suggest that the central and provincial governments should have "expert boards" to investigate various kinds of problems and suggest scientific and technical solutions.[15]

Nehru was elected President of the Association in 1942-43, but once again, jail intervened as he was interned in August, 1942, for the duration of the Second World War. But he was elected again in 1947 and did preside over the session of the Science Congress held that year. Since that time, he inaugurated or otherwise participated in almost every annual session of the Congress until his dealth in 1964.[16]

[14] Reply in debate on budgetary demands of the Department of Atomic Energy in the Lok Sabha, July 24, 1957, as quoted in Nehru, *Speeches, op. cit.*, Vol. 3, p. 515.

[15] Nehru, "Message to the Indian Science Congress," *Science and Culture*, January, 1938 (Vol. 3, No. 7), pp. 349-350.

[16] B. Mukerji and P. K. Bose, eds., *A Short History of the Indian Science Congress Association* (with Life-Sketches of General Presidents) 1914-1963, Calcutta : The Association, 1963, pp. 93-95.

Nehru used occasions such as the Indian Science Congress, inauguration of scientific laboratories and the like as opportunities to underscore the importance of science to modern Indian society and to convey exhortations—and sometimes his sense of disappointment—to India's scientific community. The last session of the Science Congress in which he took part a few months before his death in Delhi in October, 1963, was one such occasion where his feeling of disappointment and frustration at the lack of progress in developing the country's scientific capacity was revealed. "I would suggest to you," he emphasized in commenting on the growing bureaucratization of scientific institutions, that you should . . . think how we can get out of the governmental way of looking at things. I was inclined to think that some of our laboratories were gradually succumbing to our Governmental way. I think a deliberate effort should be made by them to work outside the Governmental scheme of things.[17]

Nehru's keen personal interest in science and scientific development of India is reflected in the fact that he involved himself in key appointments in Indian science, exercised initiative or provided leadership in the inner councils of government for scientific work, and determined, and defended, allocations of financial resources for the development of science. This is, to be sure, the six-sevenths of the iceburg which remains submerged—in his notes on government files, in the proceedings, not yet public, of various bodies in which he took part, and in the minds and memories of some of those individuals with whom he was most closely associated in his efforts to encourage the development of India's scientific capabilities. There are bits and pieces of evidence—for example, his efforts to protect the CSIR budget in the face of a general retrenchment of government expenditure after the Chinese invasion in 1962—but it will be many years before sufficient evidence of this character is available to attempt any kind of definitive assessment of Nehru's role in development of science in India.[18]

While it would be important to attempt to analyze what an individual like Nehru who dominated public life in India for such a long period thought on this subject, it becomes all the more so in the absence of the more detailed concrete evidence of what he actually did in the field of science affairs. We are well endowed in this respect, for Nehru wrote extensively during his long periods of incarceration and forced inactivity in prison, and spoke frequently when he was not in prison, on a great variety of subjects. Thus, the corpus

[17] Indian Science Congress Association, *Proceedings of the 50th Session, Delhi—1963,* (Part I, Official Matters), Calcutta : The Association, 1963, p. 32.

[18] Interview by the author with a senior CSIR official, New Delhi, October, 1966.

of what he said and wrote is a substantial one and is to be found in his speeches, statements in Parliament, letters, and books, particularly *Glimpses of World History, The Discovery of India,* and his autobiography, *Toward Freedom.*

Nehru was a complex personality, and this condition is amply reflected in his thinking on the human situation. His range of intellectual interests was impressive, and his thought reveals any number of significant dimensions—sometimes complementary, sometimes apparently contradictory. The analysis which follows is based on the proposition that he was a modernist, traditionalist, democrat, and synthesist and that all of these dimensions to his thought reveal something about his conception of the role of science in modern Indian society.

As a modernist, he had a substantial commitment to science and the scientific method insofar as it can be applied to economic and social problems. "I . . . have worshipped at the shrine of science and counted myself as one of its votaries," he declared in an address to the National Academy of Sciences in Allahabad in March, 1938. "Who indeed can afford to ignore science today? At every turn we have to seek its aid and the whole fabric of the world today is of its making."[19]

His concern with science was several-fold. Perhaps most importantly because he was a modernist committed to widespread economic and social change in Indian society as the only means of improving the welfare of the Indian people, Nehru saw science, and its hand maiden, modern technology, as critically important instruments for solving economic and social problems. "It is the scientific method alone", he insisted, "that offers hope to mankind and an ending of the agony of the world." [20] All of this meant to him "Five-Year Plans, industrialization, scientific development and technology."[21]

This theme reappears again and again in his speeches and writings. "It is clear that without modernizing our methods of production we cannot produce enough to get rid of our poverty," he observed at a public meeting in Bangalore in 1962. "Poverty has ceased to be inevitable now, because of science . . . there is no other way than to modernize India in methods of production. We have to absorb the

[19] Address to the National Academy of Sciences Allahabad, March 5, 1938, as published in Nehru, *The Unity of India,* New York : John Day, 1941, pp. 178-81.

[20] *Ibid.*, p. 551

[21] Nehru, *Speeches, op. cit.*, Vol. 4, p. 55.

spirit of science in India."[22] Or on another occasion a few years earlier in an article in *New York Times Magazine*, Nehru worte that "I do not see any way out of our vicious circle of poverty except by utilizing the new sources of power which science has placed at our disposal."[23]

Nehru's understanding of the importance of science in human endeavour goes much beyond its social utility in modern India. With his highly developed historical sense—well reflected in *Glimpses of World History* and *The Discovery of India*—he saw science in a larger perspective. Several chapters in the former work and substantial passages of the latter are devoted to an exploration of the meaning of science in human history. " . . . I am convinced," he wrote in *The Discovery of India*, "that the methods and approach of science have revolutionized human life more than anything else in the long course of history . . . [24]

For all of the value which he attached to scientific endeavour, Nehru was not entirely romantic in his assessment of its consequences for mankind. In a thoughtful chapter in *Glimpses of World History* entitled "The Good and Bad Applications of Science", he looks at some of the more melancholy implications of advances in scientific knowledge, notably in man's increasing capacity for destruction. "What will happen no one knows," he speculated, writing in the early 1930's with foresight into the vast advances in techniques of destruction during the Second World War.

> . . . We cannot tear the veil from the future. We see two processes going on today in the world, two rival and contradictory processes. One is the progress of cooperation and reason, and the building up of the structure of civilization; the other a destructive process, a tearing up of everything, an attempt by mankind to commit suicide . And both go faster and faster, and both arm themselves with the weapons and techniques of science. Which will win?[25]

Nehru also thought about the interrelationships of science and society—and some of the inherent coflicts between the two.

The active principle of science is discovery. Now what is,

[22] *Ibid.*, Vol. 4, p. 151

[23] Nehru, "The Tragic Paradox of Our Age," *New York Times Magazine*, September 7, 1958, p. 111.

[24] Nehru, *The Discovery of India*, (edited, with a forward and comments, by Robert I. Crane), Garden City, New York : Doubleday, 1960, p. 17. (All subsequent references to *The Discovery of India* are from this edition.)

[25] Saul. K. Padover, editor, *Nehru on World History* (condensed from *Glimpses of World History* by Jawaharlal Nehru), London : Bodley Head, 1960, p. 284.

> if I may ask, the active principle of a social framework or society? Usually it stands for conservatism, remaining where we are, not changing and carrying on, though, of course, with some improvement and further additions. Nevertheless, it is the principle of continuity rather than of change. So we come up against a certain inherent conflict in society between the co-existing principles of continuity and of conservatism and the scientific principle of discovery which brings about change and challenges that continuity.[26]

It follows from these views that Nehru saw in science social consequences far larger than simply the application of scientific knowledge to human problems. This larger view of the impact of science on society he usually referred to as the scientific way of looking at things or "the scientific temper" which he hoped would permeate all aspects of Indian society. This lead him to conclude that "some elementary scientific training . . . is essential for all boys and girls. Only thus can they understand and fit into the modern world and develop, to some extent at least, the scientific temper."[27]

But for all of his commitment to modernism—by which he meant rationalism and secularism—he retained something of a mystical view of science, particularly in its relationship to philosophy. His position was that there "can be no such thing as true objectiveness and that if a subjective element is unavoidable and inevitable, it should be conditioned as far as possible by the scientific method".[28] But he also went beyond that in seeking "a growing synthesis between humanism and the scientific spirit, resulting in a kind of scientific humanism". He felt that "our five senses and what they can perceive, obviously, do not exhaust the universe".

> . . .Science used to look at nature as something almost apart from man. But now Sir James Jeans tell us that the essence of science is that "man no longer sees nature as something distinct from himself". And then the old question arised which troubled the thinkers of the Upanishads. How can the knower be known? How can the eyes that can see external objects see themselves? And if the external is part and parcel of the internal, what we perceive or conceive is but a projection of our minds, and the universe and nature and the soul and mind and body, the transcendent and the imminent are all essentially one, to understand this mighty scheme of things objectively? Science has begun to

[26] Nehru, *Speeches, op. cit.*, Vol. 2, p. 363.
[27] Nehru, *The Discovery of India, op. cit.*, p. 330.
[28] *Ibid.*, p. 31.

> touch these problems, and though they may elude us, still the earnest scientist of today is the prototype of the philosopher and the man of religion of earlier ages.[29]

Incidentally, while many other aspects of Nehru's thought changed throughout his lifetime, there appears to be a remarkable persistence in his recognition of the importance of science, although his understanding of the complexities of the relationship of science to society certainly grew as his life progressed. "My early approach to life's problems," he wrote in *The Discovery of India*, "had been more or less scientific, with something of the easy optimism of the science of the nineteenth and early twentieth century."[30] And while some of this "easy optimism" clearly gave way in later years to a more tempered view of the role of science in modern Indian society, he remained until the end committed to its basic importance for India. In exhorting scientists to help their fellow citizens develop a scientific outlook in the country, he stated a few months before his death that "in this revolutionary age, we have to indulge in a bit of revolutionary thinking. Otherwise we do not keep pace with the age".[31] And in inaugurating a machine tool factory a couple of years before that, he stressed the critical importance of change and the role of science:

> Unless a social group or country changes, it loses its pre-eminence and becomes backward. In modern life, science and the progeny of science, techniques, technology, etc., are of the highest importance. They govern our lives and the conditions of living today. Therefore, we should understand and profit by them. What is happening today behind the Five Year Plans and other economic programmes in India is the change over from the traditional society into a modern society.[32]

But if Jawaharlal Nehru was a modernist, there was also something of the traditionalist in him. Tradition was indeed important to Nehru, and this doubtless exercised a restraining hand on his commitment to seeking change in Indian society.

> ... We can never forget the ideals that have moved our race, the dreams of the Indian people through the ages, the wisdom of the ancients, the buoyant energy and love of life and nature of our

[29] Nehru, *op. cit.*, 407.

[30] *Ibid.*, p. 10.

[31] Indian Science Congress Association, *Proceedings of the 50th Session-Delhi, 1963, op. cit.*, p. 33.

[32] Nehru, *Speeches, op. cit.*, Vol. 4, p. 446.

forefathers, their spirit of curiosity and mental adventure, the daring of their thought, their splendid achievements in literature, art, and culture, their love of truth and beauty and freedom, the basic values that they set up, their understanding of life's mysterious ways, their toleration of other ways than theirs, their capacity to absorb other peoples and their cultural accomplishments, synthesize them and develop a varied and mixed culture; nor can we forget the myriad experiences which have built up our ancient race and lie embedded in our subconscious minds. We will never forget them or cease to take pride in that noble heritage of ours. If India forgets them, she will no longer remain Indian and much that has made her our joy and pride will cease to be.[33]

We have already noted that Nehru was by no means stary-eyed in his assessment of the social usefulnes of science. He viewed the impact of the industrial revolution on individual welfare in nineteenth century Europe with great misgivings. "Science has dominated the Western world and everyone there pays tribute to it," he suggested in *The Discovery of India*, "and yet the West is still to bring the spirit and the flesh into creative harmony."[34] At this point Nehru came about as close as he ever did to taking a sanguine view of tradition in the Indian context, although his affirmative assessment is reserved for ancient tradition in its pristine form and not what he regarded as later stagnation and distortion of this tradition. Looking ahead to the halcyon day when modern science and technology will be effectively integrated into Indian society, he observed:

> ... And yet there may be fewer major obstructions on our way, for the essential basis of Indian thought for ages past, though not its later manifestation, fits in with the scientific temper and approach, as well as with internationalism. It is based on a fearless search for truth, on the solidarity of man, even on the divinity of everything living, and on the free and cooperative development of the individual and the species, ever to greater freedom and higher stages of human growth.[35]

In later years—with the passage of time—Nehru himself became somewhat less strident and more subdued in his advocacy of the place of science in modern Indian society in his later years. In an address to the Indian Science Congress in Calcutta in 1957, entitled "Science and

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[33] Nehru, *The Discovery of India, op. cit.*, p. 387.

[34] *Ibid.*, p. 391.

[35] *Ibid*, p. 391

Humility", he observed that:

> Scientists should note that they do not have a monopoly of the truth; that nobody has a monopoly, no country, no people, no book. Truth is too vast to be contained in the minds of human beings, or in books, however sacred.[36]

In as complex a personality as that of Nehru, it is possible to find any number of themes or strains, some apparently conflicting. But if Nehru was a traditionalist, he was on balance, more of a modernist, even until the very end. And it is quite possible that he was still more of a democrat than a modernist.

Nehru, of course, did not see any inherent conflict in being at one and the same time a democrat and a modernist. Indeed, to him they were intimately interrelated, and in a sense, interdependent. Two speeches of his in the Constituent Assembly at the time of Independence —one winding up the debate in January 1947 on the so-called "Objectives Resolution" which sought to spell out the purposes of independent India as subsequently reflected in its Constitution, and the other on a motion that the draft Constitution as framed by the Drafting Committee be taken into consideration by the Assembly in November 1948—reflect his commitment to political democracy and the economic and social welfare of the Indian people.

While Nehru himself apparently harbored reservations about his commitment to democracy in the face of his anxiety to improve economic and social conditions, his record and pronouncements, particularly since Independence when it became possible for him to become, so to speak, "a practising democrat", belie these earlier self-doubts. In a very revealing piece of self-analysis—published in the form of an anonymous article about himself in the *Modern Review* in 1937—he commented about himself that:

> His overmastering desire to get things done, to sweep away what he dislikes and build anew, will hardly brook for long the slow processes of democracy.[37]

But Nehru returned again and again to the theme of democracy, especially after Independence, and in perhaps the most telling action of all, was one of the earliest, continuing, and forceful advocates of embedding in India's constitutional structure what was regarded by some

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[36] Nehru, *op. cit.*, Vol. 3, p. 433.
[37] "Chanakya" (pseudonym), "Rashtrapati," *Modern Review*, November, 1937, pp. 546-547.

as a bold and dangerous step—granting universal suffrage to th hundreds of millions of India's illiterate citizens.[38]

To Nehru, political democracy meant economic democracy, and i order to achieve the latter, a vigorous programme of economic an social development, based in planning, became essential.

> Democracy normally means political democracy, giving eacl person a vote. The right of voting is good and useful but it i precious little good if it is accompanied by hunger and starva tion . . . Political democracy should inevitably lead up to economi democracy.[39]

Nehru persisted in his view that there was no inherent conflict i the thrust for economic and social betterment—which to him mear planning—and political democracy. "There is a curious argumer raised sometimes that planning involves inevitably a measure c regimentation and compulsion and is opposed to democracy, an that planning and democracy cannot therefore go together."[40] Bı to Nehru this position made no sense.

> In India we have full-blooded democracy, but not the resource The only way to fulfil people's demands is to develop the resourc as rapidly as possible. Practical considerations, as well as oth considerations, drive us to the conclusion that we have t advance rapidly and we can do that only in a planned way. think that India will advance along the particular path c democracy with a large measure of socialism—not doctrinai socialism but practical pragmatic socialism—which will fit i with the thinking of India and with the demands of India.[41]

But if Nehru was more modernist than a traditionalist and mo of a democrat than a modernist, perhaps more than anything else h was a synthesist who attempted to harmonize and integrate conflictin or divergent values and objectives into some kind of meaningful whol "He has brought to Indian planning", wrote Professor Mahalanob about Nehru, "a full appreciation of the Scientific Revolution which tranforming the world, a sensitive awareness of human values an

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[38] Granville Austin, *The Indian Constitution: Cornerstone of a Nation*, Londo Oxford University Press, 1966, pp. 46-49, 56-57.

[39] Nehru, *Speeches, op. cit.*, Vol. 4, p. 150.

[40] *Ibid.*, Vol. 4, p. 124.

[41] *Ibid.*, Vol. 4, p. 152.

cultural traditions, an inherent sense of democracy and an international outlook.[42]

Nehru himself was well aware of these different dimensions to his outlook—and indeed, to the very problems which kept on confronting him throughout his public life. Perhaps nowhere does he put this more eloquently than in his speech at the inauguration of the Swimming Pool Reactor at Trombay, the major research and development installation of the Atomic Energy Commission outside of Bombay:

> As I stand here, I have this Swimming Pool Reactor behind me and the island of Elephanta in front of me, not far away. For 1,300 years now, Elephanta has continued to present a great aspect of our history. People go to see it, even the distinguished scientists who have come here for this function, because Elephanta presumably represents something of lasting value and significance. Thirteen hundred years lie between the sculpture in the island of Elephanta and this Swimming Pool Reactor which represents the middle of the twentieth century. Both, I take it, have their place, and any person who ignores either of them misses an important element of life. I don't suppose humanity can live on reactors alone. Certainly it cannot live on Elephanta alone. In a sense, it is the combination of Elephanta and the Swimming Pool Reactor—odd as it may seem—that might produce a proper balance in life.[43]

Nehru without question belonged to the "synthesist school" among students of the Indian tradition—that is, he and others of the same general persuasion regard one of the persisting and truly significant aspects of that tradition being its capacity for "tolerance" or absorption of external cultural and other influences. Committed to this point of view, his answer to the rhetorical question with which he concluded a lecture in 1959 entitled "Synthesis Is Our Tradition" is clearly affirmative.

> Can we combine the progress of science and technology with this progress of the mind and spirit also? We cannot be untrue to science, because that represents the basic fact of life today. Still less can we be untrue to those essential principles for which India has stood in the past throughout the ages.[44]

[42] Mahalanobis, *op. cit.*, p. 8.

[43] Nehru, *Speeches*, *op. cit.*, Vol. 3, p. 505.

[44] *Ibid.*, Vol. 4, p. 7.

The issue here is not whether Indian philosophical and spiritual traditions can co-exist with scientific creativity. The problem rather arises from the circumstance that the substance of modern scientific knowledge is "a cultural" while the utilization of scientific knowledge in the form of technology is highly "culture-specific". And this is one of the major areas of difficulty confronting the research community in India today—namely, bridging the "development gap" between the laboratory and production. The process is enormously complex, but there is little in what Nehru said (and perhaps did, to the degree that establishment of applied research laboratories in CSIR outside of industry may be regarded as widening the gap) to suggest that he understood the complexities of this process.

Although any final assessment of Nehru's role in developing India's scientific capabilities is premature at the present time, at least some salient factors in this role can be set forth as hypotheses to provoke others with better access to relevant facts and recollections into refining or discarding them in the future.[45] In the first place, Nehru possessed a real and substantial commitment to science and modern technology as major forces in the twentieth century world vital to India's growth and future prosperity. While he recognized that tradition should not be, indeed could not be, completely discarded, he was far more committed to science, and in a larger sense modernization, because he was convinced that science—both scientific knowledge and the methods of science based on a rationalistic outlook on life—could solve India's economic and social problems. Unless those problems were solved, he insisted, there would never be fulfilment of Indian independence and the achievement of the freedom—not just political but economic and social as well—for the Indian people to which he dedicated his life.

But precisely because he was so convinced of the importance of science, his personal interest and his interaction with a handful of India's scientific leaders such as Homi Bhabha, S. S. Bhatnagar, Hussain Zaheer, and P. C. Mahalanobis, inhibited the development of any effective instruments for fashioning in some coherent and continuing manner government policy towards science and the scientific community.

This is not to suggest that the official machinery was not used in Nehru's dealing with these men, nor that other individuals in official

[45] The Indian Parliamentary and Scientific Affairs Committee was engaged in compiling materials on Nehru's role in science which should shed further light on those matters when published. And the Nehru Museum and Library is undertaking, as part of a larger endeavour now in progress, an oral history project to gather recollections, reminiscences, and interviews from individuals closely associated with Nehru in his efforts to strengthen India's scientific capabilities.

and unofficial positions did not impinge upon decision-making in science affairs. Nehru was the responsible minister for atomic energy, the president of the Governing Council of CSIR, and the Chairman of the Planning Commission. But because Nehru had confidence in these science administrators and policy makers and because he was the Prime Minister, his sympathy and support could disarm procedural and financial objections which would other-wise delay or cripple the schemes and objectives of these men.

To the degree that there might be said to have been any conscious effort to develop a "science policy" by the Government of India during Nehru's lifetime, it appeared to grow largely out of his relationships with such individuals as these. And after he departed from the scene, in this as in so many other aspects of governmental activity, there was little tradition of real substance to the institutionalized arrangements for science policy to carry forward. This phenomenon, it is said, once led S. K. Patil, Congress party leader from Bombay who served in Nehru's cabinet, to assert that "Nehru is the greatest asset we have because he is just like banyan tree under whose shade millions take shelter—but this is also his greatest weakness because in the shade of that banyan, biologically, nothing grows"[46].

The sometime ambivalent nature of Nehru's personality is reflected in his failure to insist upon the application of "scientific principles"—that is, use of existing evidence on the basis of systematic analysis—to decision-making in areas vital to science and technology, as well as other aspects of the work of the Government of India. Planning, as we have already seen, meant to Nehru economic and social development which in turn is based upon modern science and technology and since Nehru so clearly dominated the planning process, he must bear a substantial measure of the responsibility for the character of that process. Nehru was both a modernist and a democrat—but more so the latter—and was, therefore, firmly committed to "democratic" participation in planning.[47]

The result has been the introduction of substantial political forces and influences into the planning process—and thereby, economic and social programmes of development—in India. Nehru, who became—

[46] As quoted in *Time*, December 14, 1959, p. 22. Similar views were expressed in an interview by the author with a senior official of the Atomic Energy Commission, Bombay, November, 1966. See also Breecher, *op. cit.*, pp. 520-524 and 532-534, for a discussion of Nehru's role in the Planning Commission and his relations with Professor Mahalanobis and others.

[47] See, for example, Breecher, *op. cit.*, especially Chapter 18 (Planning and Welfare), pp. 509-554.

because of his multiple positions and personal prestige—the central focus of attention for diverse pressures from the states, the central government, private business, and other elements in the Indian polity—may well have helped to diminish the impact of these pressures. This is hard to say. But little emphasis was given to a systematic process of decision-making in allocation of resources for development (and in establishing priorities for scientific research) during Nehru's lifetime—with the result that the intrusion of political factors into decision-making about economic and social programmes within India appears to have greatly accelerated since his death.[48]

Equally in the realm of speculation is the haunting question whether anyone else in Nehru's position of political leadership and governmental responsibility would not have done as much for science. "To be modern is to be scientific," Shills rightly observes, and so indeed it is the case that virtually all political leaders in what he calls the "New States" are committed in varying degrees, whether verbally or otherwise, to developing their countries' scientific and technological capabilities.[49] If we could rightly assume that all other things are equal—which they are not—and if we could ignore for the moment that such exercises involve comparing apples and pears, then perhaps we could make some attempt to assess India's progress in strengthening her scientific capacity during Nehru's dominance of her national life with other countries in presumably comparable—or at least somewhat related—circumstances such as China. But this is tricky business, and attempts to measure one individual's impact on an extraordinarily complex aspect of human endeavour in an equally complex society will remain—at least until we have much more careful analyses than we now do of respective performances in the field of science by different nations—inconclusive, if not misleading.

It may well be that all of the problems which still remain to confront Indian science after Nehru's passing from the scene are properly attributable not to him as an individual, significant as he looms on the horizon of modern Indian history, but rather to underlying social forces and cultural factors. This in turn raises the interesting question of whether, because Nehru, especially in later years, increasingly looked upon the science as an instrument of broad scale transformation of

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[48] The "political" character of the planning process in India is also one of its great strengths. See William J. Siffin, *Politics and Planning: Perspective on a Paradox* (Paper prepared for a Conference of the Comparative Administration Group, University of Maryland, College Park, Maryland, April, 1966), Bloomington : Indiana University, October, 1966.

[49] Edward Shils, *Political Development in the New States*, The Hague : Mouton, 1966, p. 9.

social values and outlook, his impact upon the role of modern science in contemporary Indian society should be judged against that standard. But this standard is, of course, an impossible one to achieve in a single lifetime. And such a broad-based judgement inevitably raises additional questions in the realm of the philosophy of history about the degree to which individuals influence or are influenced by their times. These issues lie well beyond the scope of the present discussion.

Finally, any assessment of Nehru's impact on the growth of modern science in independent India, no matter how preliminary or mixed in character that assessment may be, must take into account one substantial and incontrovertible consequence of the energy and interest which Nehru devoted to encouraging the development of science in contemporary Indian society. For it is true that, 20 years after Independence, India has, already "in place" so to speak, a substantial scientific community and an extensively developed "infrastructure" for research and development. Whether this community and the institutional infrastructure which goes along with it are being effectively utilized in advancing the country's economic and social development is a question which must also be answered, although not in this discussion. What does matter is that the mere existence of this community and infrastructure creates new policy options for present-day leadership in Indian society. The future alone will tell whether that leadership is wise enough to choose the right options for India's continued development. But that policy options which involve a susbstantial input of modern science and technology even exist is a legacy of Nehru's determination that modern science and technology must be developed if India is to develop. And the development of Indian society along economically and socially humane lines was central to his vision of the new India.

THE SCIENTIFIC COMMUNITY IN NATIONAL DEVELOPMENT AND ITS INVOLVEMENT IN POLICY FORMULATION AND DECISION-MAKING

M. G. K. Menon

IN this article I shall consider, in the widest possible terms, the general question relating to the role of the scientific community in the process of national development; and the involvement that it needs to have in policy-formulation and decision-making for it to fulfil this role. It is not my intention to outline any specific organizational or administrative patterns; for it must be emphasised that there are no unique solutions; what is important is to recognize the essential features of this whole question, and to evolve relationships between the different entities involved in decision-making in consonance with these features; and these will change as development progresses.

The first point that needs to be made is that in India there exists a sizable and growing scientific community. This is not surprising, considering the fact that India has had a long and distinguished scientific tradition. In particular, during the course of this century there have been many Indian scientists who have carried out work that has received international recognition, and who have built up important schools of scientific research and training. A large number of our scientists and technologists capable of carrying out fine work are sought for in many of the affluent countries abroad, particularly in the United States and Western Europe; and this has, to a certain extent, resulted in the so-called "brain drain".

An important question that we must consider is how we should proceed to harness effectively the potential of this existing and rapidly growing scientific community for strengthening and speeding up the process of development.

India has a wide spectrum of peoples, ranging from primitive tribal societies to highly civilised, highly intellectual and materially well-off communities; it is indeed an interesting laboratory for the social scientist. Indian society, throughout this spectrum, is, in general, traditional and conservative; cultural values have been developed over extended periods of time and these have considerable depth.

The transformation of a society such as this, to one based on modern science and technology, is indeed a complex one. The development of scientific values and of the scientific method is an important part of this transformation and on this aspect the scientific community has a vital role to play.

Over the past several decades we have taken advantage of some of the miracles of modern science, particularly modern medicine. Life expectancy has been enhanced and infant mortality has been reduced; this has been greatly due to the introduction of the modern chemo-therapeutic agents and antibiotics and improved control of communicable diseases. The consequence is the population explosion that we are witnessing today. It is interesting to note that in the affluent nations of the world, rapid production of wealth came about first, with the industrial revolution and through the development of modern science and technology; health came later. In our case, health and social overheads have come ahead of the wealth needed to sustain them. We have still, from the viewpoint of human happiness, many hurdles to overcome: malnutrition poses serious hazards, and there are many forms of diseases still rampant; and we must make every effort to eradicate these. But along with this there is an imperative need for a massive effort on population control. In spite of significant development that has already taken place, with the large population that exists and which is growing fast, the per capita income is very low.

India is in the tropical belt that is characterised by high temperatures, high humidities, heavy seasonal rainfall such as the monsoons and so on. This leads to a very definite environmental pattern different from that of the temperate latitudes; in the latter, the environment, through extensive application of modern science and technology, is much better understood from the viewpoint of being handled for man's benefit in terms of food, water, transportation, material for construction, industry, etc; even there, the ecological problems arising from man's interaction with the environment, in particular the problems of pollution and over-use, are causing concern. The tropical environment plays a significant role in many facets of our national life, such as in hydrology, agriculture, building construction, power, etc. It is becoming increasingly clear that it is not possible to transfer, on a simple basis, technology and experience from the temperate climates to the tropics; it is essential for us to understand the tropical environment and the possibility of living in harmony with it. And it is the scientific community that has the most important part to play in this matter. Any transfer of technology and experience has also to

take into account the existing social structure and attitude framework and the transformations needed in these.

With the revolution in communication, both in terms of transportation and in terms of radio and other media, people all over are becoming increasingly aware how other people live and enjoy and it will become exceedingly difficult to hold down the expectations they have from life. If an explosion is to be avoided, development will have to take place rather rapidly. From this angle it may not be possible (nor desirable on other rational considerations), to go gradually through all the stages of development that have occurred elsewhere in the world. It will be necessary to leap-frog and to miss out many of the intermediary stages. And scientists have to be involved in the planning and technological forecasting that this demands.

There may be variations on this to the extent that Gandhian philosophy, and a corresponding value system, finds wide acceptance: in respect of a society that can restrict its needs and still be happy. Capital, in financial terms, is an important component, but it is not the only factor; human resources properly mobilized, and a scientific value system and skills, must be recognized is being of decisive significance.

Many aspects of development, such as in the production, storage and transportation of food, in industry and power, in building construction, in transportation, in communication and so forth are obviously science-based. (At this point I should emphasise that I use the word "science" to cover "Science, engineering and technology"). This being the case, science and technology have a decisive role to play in development. It is important that this is widely understood, and in particular by the scientific community itself. Fortunately, Jawaharlal Nehru understood this instinctively, and on this based the tremendous support and prestige that he gave to science in India; and the traditions that he initiated have, since his time, been the framework on which science has been regarded nationally.

I would now like to consider some aspects of policy-formation and decision-making that are involved in development. Policies have to be formulated and decisions to be taken at several different levels: from the broad and general national aspects, that define the direction in which the nation expects to go, to the more detailed and correspondingly narrower aspects that have to be defined for the implementation of specific tasks.

On the broad national front, one would, for example, have policies

for economic development, for international relations, for defence and so forth. Whilst each of these will have scientific and technological components, there will clearly be many other facets that have to be taken into account; in particular, values and ends have to be defined and also the price the community is prepared to pay for attaining these: in terms of the investments that it is prepared to put in, in the rate of development it desires to achieve, political and social structures that have to be evolved that are acceptable to the community, and so forth. These questions concern society as a whole; and the scientific community does not possess any special privilege or knowledge to decide on these in comparison with various other groups in society. In contrast, on aspects of implementation, where the scientific and technological content is high and there is less concern with purely sociological or political aspects, the scientific community has indeed an important part to play.

A few examples will clarify some of these points. The possibility that nuclear energy could be released in an explosive form and thus be the basis for atomic bombs was pointed out by the scientific community. The decision to make atom bombs was essentially a political one; it involved a large investment of about two billion dollars over a four-year period, and these were questions to be considered such as the possibility that the enemy might succeed in making one earlier and so alter the course of the war. The Manhattan Project concerned with making nuclear weapons was, at that point of time, the largest effort of high scientific and technological content in a very sophisticated frontier field. From the very beginning, through the first sustained nuclear chain reaction on the squash court of the University of Chicago, to the first test of an atom bomb over Alamogordo, the project was a complete success. The decision to use nuclear weapons over Japan was, however, again a political one, and not a decision taken by the scientific community.

Consider a more recent example of the lunar man-landing Apollo mission. The basic decision to go ahead with this programme, to give it the necessary priority and to fund it appropriately, were political; this decision was concerned with questions of national prestige, military overtones and so on; and required the allocation of large public resources that naturally raised questions relating to relative priorities. The scientific community was not involved in arriving at this decision; no doubt the decision had to take into account scientific facts concerning the possibility of completing such a task within the defined time period. Once a decision was taken to place a man on the moon by a given date and the necessary priorities and funds were allocated, the task became

one completely within the purview of the natural sciences. The clock-like precision of the entire operation, from the beginning to the end, is indicative of what can be done, with regard to the implementation of a highly complex task when it is essentially scientific and technological in character. On the other hand, tasks seemingly less complex, but with a high content of social and human factors, tend to be much more insoluble and to get hopelessly bogged down.

There are many other case studies, particularly on aspects of defence, that are of great interest from the viewpoint of the interplay between scientific and technological aspects on the one hand and social and political aspects on the other; it is not easy to disentangle these aspects in the complex process of decision-making; much has been written in this regard concerning the development of radar for defence in the Second World War and its crucial role in the Battle of Britain, in the development of tanks for warfare, the question of strategic bombing and so on. In my view all of these case studies show how decisive was the role of scientists in arriving at decisions that turned out to be ultimately the right ones.

Let us consider briefly an area closer to our national problems—namely, the role of agricultural scientists in India. With the growing population and the continuing shortage and import of food, the first and foremost task they were faced with was to ensure that the country could grow sufficient food for its needs. India's agricultural scientists have done a magnificent job in this regard; and this is the base on which one can look forward to the future with optimism on the food front. Their task was essentially a scientific one: of increasing crop yields; and their success was based on the development of high-yielding varieties capable of accepting a large amount of nutrition, and in many cases crops which could develop fast so that more crops could be grown through the year in a given area. Their next scientific tasks relate to prevention and eradication of diseases, pest control, enhancement of storage life, crop characteristics that are socially acceptable, higher nutritional content, etc. These developments have essentially been for well-irrigated areas and for sizable inputs. This success has immediately raised social questions relating to disparities within the nation in the agricultural community: the rainfall-dependent, dry-farming areas and the small farmers with no capital to invest not having benefited by these scientific advances. Again there is sufficient scientific and technological content in this problem for the agricultural scientists to work on; and I am confident that some successes can be expected. But questions relating to the increasing task force of landless labour and providing them with employment, questions of rural credit, questions

of land reform and tenancy, these and the other many well-known facets of the agricultural picture in the country do not lie within the purview of the agricultural scientists alone. In my view, agricultural policy must be discussed as a whole at the highest level, and scientists concerned with this area must be involved fully in these discussions. They will be, as they have been, responsible for some of the solutions; these could in turn lead to new problems for which they may have further full or partial solutions; and it is only by an interactive process of which they are truly a part that the optimal paths can be worked out in the overall national interests.

One often hears of the phrase "scientists on tap". This situation implies that the scientific community is on the periphery, and those concerned with policy-formulation and decision-making call in the scientists for consultation and for assigning tasks to them for being carried out, on which decisions have already been taken. Under such conditions, the scientific community will clearly have no proper sense of participation and will not give of its best. In contrast, one hears of the other phrase "scientists on top". This should be the situation in all cases where the task, once clearly defined, has high scientific and technological content. However, on broad general questions that involve more than scientific aspects, and there are inherent elements relating to the defining of values and ends, the scientific community can only expect to play its role as a part of society as a whole and cannot be "on top".

It is my overall impression that the scientific community as a whole, feels itself today to be out on the periphery. It has little to do with policy formulation and decision-making, certainly not on broad aspects of national policy, and far too little even on aspects which have high scientific and technological content. There are no doubt a few scientists with established scientific reputations, who are also known nationally, and whose opinions count in the citadels of power; and some of their views do occasionally find a place in national policy; even in this regard there is very little. The result is that the scientific community of this country relates itself to the world of science, on an international basis. The tendency is to carry out research and development that has a place in the world of science and finds recognition there but which need not relate to the needs of the nation. A difficulty usually encountered is that in the context of world science, scientists working in the affluent nations can command much greater support, (financially, in terms of equipment and so on), and competing with them becomes a highly unequal proposition. However, by choosing areas in which there are specific advantages for work in India or by working in areas where

large-scale support is not really of the essence, it is possible to be in the forefront: and all credit must be given to those scientists who have thus kept the nation's name in the forefront of scientific development whilst still working in the country.

On the other hand, if one could convey properly to the scientific community the enormous tasks which the nation faces, a great many of them with high scientific and technological content, and could get the scientific community excited about the possibility of participation in this venture, then one would indeed have achieved a break-through. Allocation of resources would become much simpler because the scientific community would be working on problems that are related to the felt national needs. And the scientific community will not be competing in the world of science on an unequal basis, against the tremendous support available elsewhere for the topical and fashionable areas. It would still apply scientific techniques and methods in solving problems in this manner and find satisfaction not only in their own creativity but also from the respect that it will command by responding to felt needs of the society around. For all of this to happen, it is vital that the scientific community is brought into the national picture in a much more vital manner than at present.

It will be asked: how does one set about this task? As I have mentioned at the beginning, there is no simple organizational measure that will work. There is an attitude framework that is needed and has to be created—a recognition that the scientist's role at this stage in our history is crucial; and instead of being on the periphery, as he is today, he should be in the mainstream of human endeavour.

As a first step, the administration of science should be placed in the hands of scientists. On this point I would like to quote Homi Bhabha who said: "It is thought by many that we are reasonably advanced in administration but backward in science and technology. This statement is misleading. We have fortunately inherited extremely competent administrative services capable of dealing with all the types of administration which had to be dealt with before Independence, in what was intended to be static and underdeveloped economy. Consequently, experience of the type of administration needed for industry, and for science and technology, has been lacking. (The type of administration required for the growth of science and technology is quite different from the type of administration required for the operation of industrial enterprises, and both of these are again quite different from the type of administration required for such matters as the preservation of law and order, administration of justice, finance, and so on.) It is my

personal view, which is shared by many eminent foreign scientists, that the general absence of the proper administrative set-up for science is a bigger obstacle to the rapid growth of science and technology than the paucity of scientists and technologists, because a majority of the scientists and technologists we have, are made less effective through the lack of the right type of administrative support. The administration of scientific research and development is an even more subtle matter than the administration of industrial enterprises, and I am convinced that it cannot be done on the basis of borrowed knowledge. It must necessarily be done, as in the technologically advanced countries, by scientists and technologists themselves."[1]

A further necessary step is to ensure that there is a proper two-way dialogue between the scientific community on the one hand and those concerned with policy-formulation and decision-making on the other. This dialogue is to ensure that the views of the scientific community concerning aspects of development are heard and given cognizance; on aspects involving scientific and technological matters the scientific community will have much to say that is important; on broader national aspects it will contribute what is expected of an intelligent, dedicated and concerned section of society. Through this dialogue the scientific community can be kept informed about what is expected of it on various aspects of development. To be frank, a scientist in the country does not really know how he is to function to be most effective for national development. Many are unemployed and many others underemployed. There is no dynamism in the definition of tasks, no urgency about implementation, no assignment of responsibility and of being called to task for non or delayed implementation, no feeling of being wanted and of having an important role to play. In spite of this, there are good, dedicated individuals and groups, and good institutions who have set targets for themselves that they believe to be in the national interest and which they attempt to fulfil. It is not clear, even in these cases, that these tasks are the best that could be assigned to them or that need to be solved.

How is this dialogue to be carried out? The scientific community exists in universities and in various research institutions and national laboratories; it is a widespread community. It consists not only of senior scientists who occupy high positions, but of large numbers of younger scientists full of enthusiasm and energy; and into this latter group there is a constant stream of new-comers, freshly emerging from

[1] "Science and the Problems of Development" lecture delivered by Dr. Homi J. Bhabha to the *International Council of Scientific Unions* on January 7, 1966, Bombay.

their university training. I must strongly emphasize that I have no intention of drawing artificial distinctions between older and younger scientists, and between senior and junior scientists; such distinctions would be totally alien to the spirit of science; for in scientific life there are, and should be, no such hierarchies. My pleading would be to bring in the younger and junior scientists into the mainstream of national endeavour; and they will, I am sure, provide powerful support to the few senior scientists who are already in the picture.

On the other side, in terms of organized agencies, there is the Committee on Science and Technology, (COST), which is the highest level body on science and technology advising the Union Cabinet; there is in the Planning Commission a scientific wing; there are the large integrated areas of science coming under the Atomic Energy Commission, Council of Scientific and Industrial Research, Defence Research and Development Organization, Indian Council of Agricultural Research, Indian Council of Medical Research which have their apex bodies; there is the University Grants Commission which deals with educational institutions; there are scientific academies and associations, such as the National Institute of Sciences, the Indian Academy of Sciences, the National Academy of Sciences, and Indian Science Congress Association; and there are many other scientific organizations and structures, particularly in government, which I do not spell out in detail here.

Other than public relations documents of the usual type, that are rather sterile and totally inadequate, and statutory reports, very little is produced to encourage a proper understanding or appreciation of the policies, programmes and decisions in various areas of national endeavour. There is, in my view, an unnecessary tendency in the country to keep a great deal of information secret or restricted. No doubt there is need to keep information restricted in certain facets of national endeavour, particularly in strategic areas such as defence. But the less that is kept secret the greater the chance that it will remain so. Much that is classified at the moment could be made public knowledge and then be adequately and publicly debated. Poor policy formulation and bad decision making will not then be covered by the umbrella of secrecy. There should be a regular system of official "White Papers" on various aspects of policy formulation and programmes, in fact relating to every major decision. Criticism of these, on scientific and technological grounds, should be considered a desirable and healthy situation rather than as an act of indiscipline or of insubordination. My idea is not that when a particular decision has been taken up for implementation that the individuals concerned with this aspect indulge

in criticism and debate; at that stage their responsibility is to see to it that the task is carried out properly. Criticism and debate must take place earlier, and there must be adequate opportunity given for this before a decision is taken that leads to implementation. A healthy tradition has to be built for this.

The development of science is characterized by such a process—for science is essentially public knowledge. Scientists make observations, conceive hypotheses, and make theories. These facts, hypotheses and theories are published, and reported at scientific meetings. These are critically studied and tested by other competent and disinterested individuals, and in the process find acceptance, rejection or get modified. And it is that which evolves through this process, that is ultimately found so pursuasive and almost universally accepted, and which corresponds to a consensus of rational opinion over the widest possible fields, that is science. And it is this approach of science that the scientific community should be given the chance to apply on the national scene, particularly in areas of high scientific and technological content.

It is often felt that there is far too much of discussion in the country, and much too little in the form of decisions and of implementation. This complaint is mainly with regard to aspects in the social and political horizons, where one can expect such discussions in a democracy when different priorities on values are set by different individuals and groups. Where such a complaint is advanced in the case of items with high scientific or technological content, in my view the problem is the absence, in the first instance, of a well-documented, well-reasoned "white paper"; and discussions based on inadequate or incorrect information are bound to be diffuse and fruitless.

Some time ago a Round Table of scientists was convened at the instance of the Prime Minister to discuss various aspects of science and development on a general basis. Though I did not attend it myself, I got the impression that this had created a certain enthusiasm and interest, and a feeling of involvement amongst those who had participated. It would be good to have meetings in this spirit, to bring together scientists and technologists from different parts of the country, and from different disciplines, on a rotating basis under the aegis of a high-level body. (The presence of the Prime Minister, in the case of the Round Table, gave it a status and prestige which was a positive encouragement; one should not lose sight of psychological factors of this nature.)

Members of the scientific community need to be educated in the

process of decision-making. For this it is essential that the institution to which they belong has an adequate system of delegation of powers; wherever powers can be delegated with advantage, from the viewpoint of cutting delays and from the viewpoint of preventing an overload on the higher echelons, this should be done. There will no doubt be misuse as well as mistakes, but this will be more than compensated by the increased tempo and the sense of active participation that it will result in. Concentration of power and of decision-making at the highest levels in the framework of any institution is characteristic of a static hierarchical system.

The scientific community has the following two different types of roles to fulfil. On the one hand, there is the tangible aspect relating to the implementation of specific tasks with high scientific and technological content, and participation in the policy-formulation and decision-making that is related to these tasks. On the other hand there is an even more important function for the scientific community, and this is an intangible one. It is concerned with the process of education and the development of scientific values and technological skills. It is on this aspect that Homi Bhabha (*loc. cit.*) emphasized: "The problem of establishing science as a life and vital force in society is an inseparable part of the problem of transforming an industrially underdeveloped country to a developed country."

One is often given the example of Japan, which has imported know-how on a large scale and has achieved a high rate of growth of the gross national product; this example is often quoted in justification of extensive import of know-how by India. What we could learn from this example is that in the home country there must be a sizable base of personnel capable of using most effectively know-how and skills received from abroad, for adapting these to the local requirements and for developing them further to their advantage. If such a base exists, imported know-how can become part of a forward-moving self-generating process. But in the absence of this base such know-how will in general be expensive, for it will be used solely for the accomplishment of certain specific tasks, and cannot be related to the whole system. And I believe that it is the task of the scientific community to create this base.

I have mentioned earlier that science develops on the basis of achieving a consensus of rational opinion over the widest possible fields, through a process of publication, discussion and criticism. For this it is essential to have a sufficient number of persons who can participate in such discussions and criticism, and who have been trained in the process of rational thinking or what is often called the "scientific

method". An important task of the scientific community is to enlarge itself, to develop an ever-increasing number of those trained in the scientific method, who can participate in this process of rational thinking, and thus propagate scientific values. It is the growth of these scientific values in society as a whole, for which the scientific community has prime responsibility, that Jawaharlal Nehru was so fond of referring to as "scientific temper". In this task, organizations of scientists (such as the National Institute of Sciences, the Indian Academy of Sciences, the National Academy of Sciences, the Indian Science Congress, etc., and the University Grants Commission) have an important role to play. This task is so enormous, considering the conditions that one finds in India today, that it is vital to bring into the picture a much larger number of scientists than have hitherto been involved. These aspects concern not only the few distinguished scientists or the few scientists who occupy high positions in public life, but should be a matter of concern to every individual who believes in scientific values. It is sad that the scientific community in India has not as yet played a significant role in this matter, so vital for the real development of the country; for this role what is most needed is for the scientific community to set its own house in order and to act in concert to propagate the scientific values that it believes in.

In concluding I would like to draw attention to a little known speech given by Mr. J. R. D. Tata as President of the Court of the Indian Institute of Science, Bangalore, on the occasion of the Fourth J. N. Tata Lecture on 23rd September, 1968. Mr. J. R. D Tata said:

> "While nowadays Government rightly pays heed to the voice of the economist in the counsels of the nation, the advice of the scientist is seldom sought except in purely scientific matters. The time has come when scientists should no longer merely stand on the periphery of the decision making in a country whose problems cry out for scientific solutions. During the past 150 years or so, scientists, in which term I include engineers and technologists, have been the major agents of social change in the development and evolution of the human society in the more developed countries of the world. We need only note how the development of steam, of electric power, of the railroad, the motor car, the aeroplane, the telephone, radio and television, antibiotics, not forgetting, alas, modern weapons of warfare, all of which were the creation of scientists, have transformed out of recognition societies which had been largely stagnant for centuries, as much of ours still is today. Increasingly, and at a rising tempo, scientific and technological advances are transforming

the very fabric of society. "... should he not play a major role in policy making not only in his own field of science but also in planning the social and economic evolution of society?

"Up to now the scientist has fulfilled his role of innovator of economic and social change almost absent-mindedly. The consequences and impact on society of his discoveries and inventions were seldom foreseen and were understood long after the event, by which time it was too late to change its course. Even where the scientist foresaw the impact and possible consequences of his invention he was never allowed the position and authority to prepare society for it. There comes to mind the appalling congestion on highways and city roads in many countries caused by the failure to foresee the impact of automobile mass production; the monstrous growth of cities, large parts of which turn into slums; the massive pollution of the air over cities by exhaust fumes and of lakes and rivers by industrial effluents; the senseless proliferation of atomic weapons, the stockpile of which today far exceeds that required to blow up the whole world; the population explosion, largely due to medical discoveries, and so on.

"The people of our country, like those of other developing nations have suffered great economic hardship in the last century from having lagged behind the West in their technological and industrial development. The one redeeming feature of this may turn out to be the chance it has given us to avoid some of the mistakes made in the West and to plan from the start the adaptation of our society, our cities and of our way of life to the mechanized, motorized and automated environment in which we shall soon live.

"Let us harness to the collective ambition of our people the young scientists of our country who, as in many others, are dreaming of unlimited energy supplies, of the fantastic reach of electronic computation, of harnessing the sea, its salts and its teeming life, of exploiting space and of probing the deep mysteries of the basic life molecules, some of this dreaming directed to no immediate end, but much of it for the ultimate welfare of the people."

PARLIAMENT AND SCIENCE

Krishan Kant

THE last two decades have witnessed a process of rapid transformation in different parts of the world on an unprecedented scale. Modern Science and technology have been the principal instrument for this transformation which is mainly distinguished by its economic character. In addition this has resulted in the evolution of a new outlook, a new conception of education, of scientific research and industrial production, of new types of investments to generate inventions and technological applications of great social and economic significance. Science and technology on the one hand, and the social and economic progress of a country on the other, are becoming increasingly integrated and dependent upon one another *now* more than ever before. In this process, the government and Parliament of a nation, by their very structure and functional character, are necessarily and intimately involved.

The role of government as a patron of science is not altogether a new phenomenon. Historically speaking, we may even go back to the nineteenth century when the government supported several scientific surveys, meteorological departments, medical centres, universities and technical schools. Nevertheless, the impact of such a support hardly manifested itself in spheres outside the government, and much less in the larger social and economic spheres. The politicians and men of public affairs were generally indifferent to it. Understandably, the World War II, the race for acquisition of power among the different advanced nations and their determined attempts to enter into international markets based on the internal economic and military strength gave a new dimension to the political and governmental relation with science and technology. Atomic energy programmes and space research as indicators of the prestige of a nation, too, have contributed a great deal to the furtherance of science and technology in the context of the national body politic.

Science Policy and Parliament

Scientific and technological research needs huge investments, and

calls for a judicious utilization of scarce resources like raw materials, trained manpower and technological skills available in the country. In recent times, for this reason, each nation has been endeavouring to evolve what has now come to be known as its science policy. Though it is rather difficult to define science policy in clear terms, the science policy of a country is an expression of (*i*) the government's assessment of the national research effort, (*ii*) determining priorities, (*iii*) of programming and coordinating of research in different sectors along with the requirements of trained manpower so as to obtain the maximum benefits out of the resources expanded. The science policy of any country cannot be blind to the future research and technological needs and, hence, it is a determinant of a continuous process of thinking and sustained action. In all these matters, Parliament has a key role to play, as the nation's highest decision-making body. Central to the country's economic and international policies is *now* the science policy which dynamically affects the first two, utilizing as it does the creative factors and natural resources for the country's development.

In the formulation of the science policy, the concern of Parliament is manifold. First, there is the question of quantitative estimation of the nation's scientific and technological potential. There is the determination of priorities for promotion of scientific and technological education, research and development, their institutionalization, etc. Then there is the need to promote the development of research consciousness in private industry in the over-all attempt at attaining the economic growth over a stipulated period. There is also the question of evaluation of research *vis-a-vis* the inputs and managerial structure. These call for specific plans in the respective fields, leading to mutual compatibility or reconciliation of the competing claims of each sector. Parliament cannot help becoming deeply conscious of these implications and *per force* has to be concerned with the total scientific effort, depending upon the country's needs and resources—human, financial and natural.

Chancellor Josef Klaus of Federal Austria, while opening the Second European Parliamentary and Scientific Conference, at Vienna in 1964, rightly said that "in our time, there can be no sound politics without permanent contact with science, as there can be no sound science without continuous contact with social and political realities". Over these five years—the truth of the statement, if anything, has been borne out in an ever increasing measure. For, there is no doubt that the Parliamentarians cannot but recognize in science an economic

potential of far-reaching importance involving enormous amounts of resources and deployment of trained manpower.

In recognition of the Parliament's role in the elaboration and control of national science policy, the 56th Inter-Parliamentary Conference at Lima, in a resolution called upon national parliaments to pay due attention to their responsibilities in the sphere of science and technology, take initiative in defining of the objectives of the national science policy in clearer terms and further ensure that the national scientific and technological potential is harnessed for economic development and the needed resources and institutional arrangements are provided for implementing the national programmes of science development.

The conference also invited consideration by legislative assemblies of the following procedures to ensure that their new responsibilities in the field of science are fulfilled:

(*a*) Establishment of standing parliamentary committees specially constituted for the examination of question relating to science policy with the aim of helping to coordinate scientific activities and avoiding duplication of effort without adversely affecting basic scientific research;

(*b*) Provision to parliamentarians of access to all sources of information and the assistance necessary for debating questions regarding science policy with a full knowledge of the facts;

(*c*) Creation of opportunities for exchanging ideas with qualified representatives of the scientific community drawn from industry, education and other private circles, as well as from Government; and

(*d*) Adoption of long-term and medium range plans for scientific development, as well as functional budgets for scientific activities.

Science Policy and Science Structure in India

In India, it is a fact of great significance that the Parliament has adopted a Scientific Policy Resolution (March, 1958). This Resolution shows the political and social far-sightedness of the Jawaharlal Nehru who moved the Resolution in Parliament, with the aim of intimately involving Parliament in scientific affairs of the country. The

Resolution, emphasising the importance of technology, says, "The key to national prosperity . . . in the modern age . . . lies . . . in the effective combination of three factors, technology, raw materials and capital, of which the first is perhaps the most important since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in national resources, and reduce the demand of capital." If the Resolution were to result eventually in the exploration of unchartered resources of our country, increased production, and gainful employment of scientists and technologists in a creative way, it is but proper that Parliament will have to play its role in an ever increasing measure. This is all the more necessary in view of increasing involvement of the government in the expanding science structure of the country.

We have developed in our country quite a sizable science structure in 5 major areas of applied scientific research, namely, industrial research, agricultural research, medical research, defence research and research in an atomic energy. Basic research is for the most part carried out in universities. There are at present about 30 research institutions functioning under the Council of Scientific and Industrial Research. In addition, there are some 60 experimental stations, survey stations and field centres attached to various laboratories equipped for applied research including development research. The Bhabha Atomic Centre is also associated with a number of research units and projects. The Department of Atomic Energy supports special research institutions like the Tata Institute of Fundamental Research, the Saha Institute of Nuclear Physics, the Physical Research Laboratory, the Indian Cancer Research Centre, etc. The Defence Research and Development Organization has over 25 Institutions under its management for research in armament, electronics, aeronautics, engineering and the like. The Indian Council of Agricultural Research and the Indian Council of Medical Research have a network of research institutes all over the country. Over 70 universities provide training and research facilities in all the major fields of science and technology. The total expenditure on scientific research has increased from Rs. 27.2 crores in 1958-59 to about Rs. 119.7 crores in 1968-69. The number of scientists and technologists engaged in research and development in 1968-69 was 62,000 as against 18,000 in 1958-59.

In spite of Government's initiative in promoting, encouraging and assuming responsibility for the development of science and scientific research in various fields, there is no proper structure for spelling out the operational details of science policy and ensuring its implementation. That is why we find imbalance in the growth of scientific

research in sectors like agriculure, electronics, industry, etc., as well as the unemployment and under-employment of scientific and technical personnel. The attempts made so far at coordinating the various research activities have not been successful. The Scientific Advisory Committee to the Cabinet was found to be inadequate. It has been replaced by a new Committee on Science and Technology (COST) which is surely an improvement on its predecessor. This new experiment will be watched with interest.

National Science Budget

An important organizational device which can help Parliament in integrating and reviewing the scientific research effort would be the preparation of "a Science Budget", as an integral part of the total budget of the Government of India. The structure of the budget as presented to the Parliament every year is a sort of a panaroma of various sectorial spendings and it is rather hard to make out from it what is the actual effective investment in the scientific and technological reseach. No special recognition is given to special areas of research of national importance in framing the budget. A Science Budget, which would show the total proposed financial appropriations and expenditure in recent years in regard to scientific research in one place, will be a great help to Parliament in taking decisions about allocation of national resources to the different sectors of scientific research. It would also be useful for purposes of assessing progress and evaluating benefits. A confrontation with the major areas of research and the identification of important problems which are productive of results in the foreseeable future must be reflected in the Science Budget. It is true that scientific research cannot be subjected to the limitations of the annual budget. Even so, a multi-year budget for special fields of research of national singnificance should not be difficult to formulate. This, no doubt, calls for a Science Plans with clear perspectives, priorities and programmes on the one hand, and projections of future research and technological needs including requirements of trained-manpower on the other. The Science Budget should reflect the annual plan of research in the perspective of the Science Plan for a period of five years or longer.

Parliamentarians, Scientists and Economists

To help the Government in developing a full spectrum of the science budget and inter-relating scientific and technological research to the economic plans of the nation, the parliamentarians need the assistance of scientists and economists; in other words, there is a great necessity for a purposeful dialogue between the parliamentarians

and the scientists and the economists. This will enable the former to have an insight into the priorities, operational realities and the necessary compromises by which they will be able to arrive at truly national decisions. They will thus be able to influence the Government to structure the budget in such a way that it will lead to meaningful investments in several sectors of research. It is generally recognized that there is at present a wide scope for inventive activity in modern physics, chemistry and biology for the purpose of promoting industrial development and human welfare. Parliament will require necessary basic data about the national needs and potentiality of scientific research, the cost of such research, returns expected, etc., for giving its judgement on and promoting larger investment in the scientific research. It will also be necessary to involve suitable methods of evaluating the benefits accruing from scientific research. Hence, the economists and the scientists and parliamentarians have to get together to improve the tools of evaluation to mutual advantage.

With the increasing need for mutual consultation, especially between the parliamentarians and the scientists, the necessity for a Parliamentary forum has been felt in several countries. For example, in the U.K. the un-official Parliamentary and Scientific Committee came into being as early as in 1939. As N. J. Vig says in his book *Science and Technology in British Politics*, "this un-official back bench committee brought together interested MPs, Peers and representatives of outside scientific organizations, for the purpose of educating politicians as to the potential applications of science in government and society, and improving mutual understanding on public policies affecting scientific development. This committee was able to influence the expansion of technological education in the non-university sector, although it avoided the controversial policies and did not think in terms of enacting scientific legislation. Its main concern was one of developing parliamentary awareness of science policy matters. Its bi-monthly general meetings used to be addressed by an eminent scientist on current scientific affairs. The Committee also served as a lobby for various research organizations".

In India too, a non-official Parliamentary and Scientific Committee has been functioning since August 1961. The main objectives of this Committee are: (*i*) to provide members of the Parliament with authoritative information from time to time; (*ii*) to bring to the notice of Members of the Parliament and Government the results of research and technical development which bear upon questions of current public interest; and (*iii*) to arrange for suitable action through parliamentary channels whenever necessary in order to ensure that proper

regard is paid for the scientific point of view. It is serving as a forum for the Members of Parliament and the scientists to get together and to exchange ideas on the current scientific problems. Besides organizing regular meetings it has brought out two reports on subjects of topical interest of Parliament: (*i*) Science Education in Schools, and (*ii*) Population Control and Family Planning. The latter report was accepted by the Conference of Health Ministers. At one of its annual meetings the Committee discussed the problem of implementation of Scientific Policy Resolution under four heads: (*a*) science and industry, (*b*) science and agriculture, (*c*) science and medicine, and (*d*) scientific education and research. The Committee brings out a journal entitled 'Science in Parliament' which gives summary of discussions on scientific matters in Parliament and articles on science development of interest to Members of Parliament and scientists.

In 1964, the Second Parliamentary and Scientific Conference was held in Vienna where the parliamentarians and the scientists from member states of the Organization for Economic Cooperation and Development (OECD) met together and discussed problems of their mutual relationship in a world which is fast changing by advances in science and technology. Some of the views expressed and the conclusions arrived at this Conference are of great relevance. It was suggested that regular committees could be established for science policy, as a part of parliamentary machinery and that Science and Parliament must be brought close together by all possible means. The Conference reaffirmed its belief that "closer cooperation between scientists and parliamentarians is essential not only to establish national and international policies for the development of science but also to permit the conscious integration of science in the formulation of national policy by parliamentary procedures."

Public Accountability of Science

It is now desirable at this stage to ponder over the mechanism adopted and practice followed over the years in the matters concerning evaluation of progress or public accountability pertaining to investments in science and technology. These are generally considered as a part of the routine investigations by the financial committtees set up by Parliament, such as the Estimates Committee and the Public Accounts Committee, which normally go into the government expenditure and administrative efficiency. The question is whether these committees have developed adequate machinery or techniques for assessing the utility of the expenditure on science and technology. On closer analysis, it would seem that it would be rather difficult to study

the overall expenditure pattern *vis-a-vis* the general effectiveness insofar as investments in scientific research are concerned.

The debates in Parliament and the questions on scientific affairs asked by the MPs are more in the nature of general criticism and advice, and drawing the attention, sometimes, of the Government to malpractices and inadequacies. They have their inherent limitations in this country, and even in the U.K., the position seems to be no better. As Vig records in the book cited earlier 'there is no way to compel a Minister to give detailed and informative answers, and of the definite study of the question procedure concludes that this device has generally failed as a counterweight to increasing executive powers. In matters pertaining to science and technology, an assessment of this type would appear obvious'—Indeed, a large proportion of questions involve 'Science' peripherally and indirectly, and most add little to public knowledge of general government policy or the rationale behind it "... Questions do not, in any event, provide suitable occasions for detailed explanation of complicated technical matters."

A Parliamentary Committee on Science

What are then the other channels available to Parliament continuously for reviewing the process in the implementation of scientific policy and programmes and directing their adaptation to the changed needs. One may be of the type of inquisitorial committees on science. These science committees consisting of selected members of Parliament, interested in different sectors of scientific and technological research, should have the power to summon the scientists, technologists and economists entrusted with the responsibility of expanding government funds and to obtain from them detailed and exhaustive information on the projects with which they are associated. Qualitative and matter-of-fact information gained by a direct confrontation of this type will result in an intimate involvement of the parliamentarians in evolving of methods for the exploitation of scientific results for economic purposes. Perhaps, the built-in contradictions and sources of inaction in the scientific organizations may be resolved satisfactorily with help of the parliamentarians in this way.

It will be interesting to watch the experiment of the British Parliament which established a select committee on Science and Technology in December 1966. The members of the committee (not more than 15 in number) are nominated by the House of Commons. The Committee has power to call witnesses and generally takes evidence in public. This gives the Members the opportunity to participate in the formation of science policy and review its working.

The other channel by means of which the parliamentarians would be able to get the desired information can be through a scientific information service which may be set up under the control of Parliament's Secretariat. This matter is dealt with in some detail in the next section. Alternatively, the non-official Parliamentary Scientific Committee could develop its activities in this direction and supply the Members with the desired information. Information would be needed on personnel available for research and development and their distribution sectorially, the recurring costs of R & D in different sectors calculated on a unit basis, capital costs of R & D, research utilization by the industry, import of technical know-how, degree of self-sufficiency attained in the industries and so on.

Science Cell

At present, the parliamentary sources of information on scientific affairs are few and far between. The information the Members of Parliament get in a routine way—from the report published periodically, *ad hoc* literature sent to them from several scientific organizations from time to time, personal contacts with the scientists, and occasional participation in scientific conferences and seminars—is generally not adequate enough to enable them to raise issues of current scientific or technological interest in Parliament. There is a great need for an active "science cell" attached to the Parliament, which would provide, even on short notice, material and data for the members, depending upon their needs. It is interesting to note that such a Science Cell was established in the U.K. in 1966. Such a Cell has been in existence in the U.S. Library of Congress for a much longer period.

Trends in the Foreseeable Future

With the increasing tempo of economic development the members of Parliament will become increasingly concerned with the many manifestations of the science policy of the country, both structural and functional. They will be more and more interested in the planned attempts to maximize the benefits of science and technology for social development. Whether or not there should be a separate Minister for Science or Technology to coordinate the scientific activities in different sectors from the point of view of management and efficient administration with executive powers, one could see some forward steps taken in this direction. The Committee on Science and Technology in our country is a case in point.

The Prime Minister has agreed to lay on the table of both the houses of Parliament an Annual Science Report, giving in a consolidated

form the scientific activities of the various departments of the government. This will be for the first time that the country and the Parliament will have a coordinated view of the national scientific effort. The discussion of the report in Parliament will give an opportunity to look at the question of science and science policy in the perspective of our political and economic goals. I am sure it will raise many issues of objectives, of organizational and functional nature with which the Government and Parliament will have to concern themselves. In the process of solving these issues, science structure of the country may have to undergo many changes. Some innovations may have to be made even in the parliamentary sphere to enable the Parliament to play the desired role of critically evaluating and specifically directing the science policy of the country.

Even with the present state of emphasis on the scientific and technological education, the scientific and technical manpower will be substantially large in the next few years. An effective deployment of this manpower which is the nation's asset, may assure in the near future a research effort of far greater dimensions and import than at present. There may be new turns and trends to which Parliament will have to pay greater attention.

In not too distant a future, it is not unlikely that the scope and implications of science policy of our country may undergo appreciable change. At present, the expenditure on scientific research is sought to be related as a certain percentage of the Gross National Product (GNP) of the country. Detailed criteria for determining the level of financial allocations to different scientific activities have not been worked out yet. Choices will have to be made and priorities determined. Here, Parliament will have to play a dynamic role and offer solutions in the context of the changing socio-economic conditions, scientific and technological needs of the country, viability of structure of scientific research, etc. The decision-making process, too, will engage the attention of members of Parliament as they would be increasingly called upon to give their views, in and outside the Parliament, on various scientific issues.

In recent times a necessity has arisen, particularly in the developing countries, to think of what has come to be known as the political parameters in the process of decision-making relating to the allocation of resources. For, this allocation is in a delicate way involved in the country's external policy for scientific and technical assistance and collaboration. The import of technical know-how is a case in point. The grant of licences to technology-based industries has to be

examined in great detail in the national context. The degree of self-sufficiency to be attained in the matter of technology is as vital to the nation in general as it is to the scientists and technologists themselves. The decisions on these surely depend upon the general political trend of the country. Ultimately, in all the countries, the allocations will depend upon the political, economic and social choices for promotion of science and technology.

PLANNING AND PROGRESS OF SCIENCE EDUCATION

R. D. Deshpande

DURING the last twenty years, science has contributed many distinguished characteristics of our civilization. National security, economic stability and public welfare depend less on the sheer production capacity and natural resources and more on quality and extent of education and research in sciences and technology. There is a growing realization amongst the nations that science education and research are crucial to the entire developmental process. The emerging scientific revolution together with the thrust towards modern industrialization in under-developed countries, demand a programme of science education with new dimensions. It is realized that highest priority has to be given to the improvement of quality as well as balanced expansion of science education and research. It is now more than ten years back that the Government of India formulated their Science Policy Resolution which envisaged the cultivation of science and scientific research in all its aspects—pure, applied and education. The resolution reaffirmed the Government's decision to train scientists of highest quality through an intensive programme of training and also to encourage science and development of healthy scientific community as a sound basis for balanced economic development. Realising the importance of purposeful science, education and research in the light of progress achieved by Japan and USSR, the Central Government and its agencies as well as the State Governments formulated programmes aimed at improving the quality of science instruction in schools, colleges and universities. It is proposed to give later in the article a brief review regarding the various programmes that are underway for the improvement of science education.

Expansion in Science Enrolment

The important problem facing the planners of science education in this country has been the problem of numbers. In USSR, UK and USA, the problem of numbers is being squarely faced. Unless larger numbers of students are trained in elementary aspects of science and encouraged to develop manipulative and intellectual skills, there cannot be sufficient numbers in the top echelons to provide the necessary leadership and diversity in our national, educational and

technological efforts. It is for this reason that the National Science Foundation in the USA has encouraged larger number of scientists in the High School and Junior College level and provided a tapering of knowledge at an advanced level. Because of the growing importance of science as well as the prospect for better employment opportunities, there has been an increasing pressure for studying science subjects in the schools, colleges and universities. Because of lack of suitable avenues, a number of school leavers have been left with no alternative but to join the universities and pursue studies in science subjects.

During the last ten years, there has been a phenomenal expansion in the enrolment of students in the science subjects in the schools and the colleges. As against 16,000 high schools in 1959-60 there are today more than 30,000 high schools giving instruction in various science disciplines. The draft Fourth Five Year Plan—1969-1974—envisages further expansion of science education and improvement at elementary, secondary and university stages. The enrolment in the science subjects which was about 26 per cent of the total enrolment at the university stage in 1960-61 is expected to increase to about 40 per cent in 1973-74. Science Education will therefore have to be improved notably at secondary and elementary level but more intently at university stage. With this in view, the draft Fourth Plan has suggested programmes of pre-service and in-service training of teachers, upgrading of curricula in sciences and provision of laboratory facilities. The draft also envisages the strengthening of administration and supervision of science programmes.

Like any other developing country, this expansion has been at the expense of quality although there have been some places where excellent improvements have taken place mainly through efforts of dedicated group of people. Similarly at the university and college level, there has been a great upswing in the enrolment of students studying science subjects. The following table indicates the growth in enrolment in Indian universities and colleges during 1961-1967:

Year	*No. enrolled in the colleges*	*No. enrolled in University Deptts.*	*Total +enrolment*
1961	3,13,494 (91.4)	29,630 (8.6)	3,43,124 (100.0)
1962	3,53,622 (90.6)	36,512 (9.4)	3,90,174 (100.0)
1963	3,97,759 (91.2)	38,166 (8.8)	4,35,925 (100.0)
1964	4,36,094 (91.1)	42,608 (8.9)	4,78,702 (100.0)
1965	5,19,155 (91.8)	46,099 (8.2)	5,65,254 (100.0)
1966	6,05,685 (92.5)	49,214 (7.5)	6,54,899 (100.0)
1967	6,75,429 (91.5)	62,429 (8.5)	7,37,858 (100.0)

In 1967-68, there were 1,227 affiliated colleges which offered facilities for study up to B.Sc. while 172 conducted courses leading to a M.Sc. degree. Only a small percentage of the total number of colleges offer courses in sciences at the PUC level. As would be seen in the above table, the percentage of students in sciences in the affiliated colleges has gradually gone up and now stands at 91.5 per cent of the total enrolment in the universities and colleges. There has also been a slight increase during last few years in the numbers studying at the university departments, but this growth cannot be treated as significant in relation to the abnormal increase in the enrolment in the colleges. In view of this, the improvement of science in the colleges has to be given highest priority if there has to be an overall upgrading in the standards of instruction.

Current Programmes for Improvement of Science Education

The improvement of science education at all levels has been engaging in the serious attention of the Central Government, State Governments and other agencies. Although the important objective has been to upgrade standards of instruction, the scope has been varied depending on the nature of the programmes. At the school level, the National Council of Educational Research and Training has been charged with the responsibility of initiating quality improvement projects in the schools and training colleges. In the area of curriculum development, the NCERT has revised syllabus in general science for classes I to VIII. It has also brought out some useful publications, such as Teachers Hand-books and Guide-books which include activities, methods of teaching and improvization of simple instruments with locally available material. In the light of the report given by the UNESCO Planning Commission and the views of the All India Science Teachers' Association, subsequently endorsed by the Education Commission that science should be taught in the middle classes as a discipline, the NCERT has developed syllabuses for teaching of science as Physics, Chemistry, Biology and Mathematics at middle school classes with UNESCO help. Emphasis in these materials is on systematic teaching of various science subjects in terms of reorganization of science curriculum syllabi for teacher training institutions, developing science laboratories in teacher training institutions by providing science apparatus and equipment, developing intensive teacher training programme in science for both teacher educators and primary school teachers, development of inexpensive science teaching kits and teachers manual for health and nutrition and for providing mobile science demonstration units for in-service training of school teachers. Despite some initial setbacks, the scheme is working satisfactorily and the materials are being published.

One of the important developments in the improvement of course content at the high school level has been the setting up of 20 Study Groups by the NCERT in Physics, Biology, Chemistry and Mathematics at different universities in the country under the leadership of University Scientists. These study groups will prepare curriculum materials, textbooks, syllabi, teachers guides, teaching aids, evaluation materials, etc., in the subject of their concern. The study groups are expected to complete the curriculum materials within the next two or three years.

Another important project has been the introduction of National Science Talent Search Scheme. It has been long recognized that to discover talent for science among pupils and to help in developing an essential element in the process of preparation of creative scientific workers. The secondary stage of education appears to be the right stage for identifying such talent, since it is during the formative years that potentialities of the child unfold and this can be helped to grow to their fullest extent. About 7,000 students have appeared each year during the last six years and so far 2,100 have been selected for the award of scholarships and merit certificates. The duration of the scholarship has been extended from B.Sc. first year to doctoral level.

Apart from this, assistance has also been given to the high and higher secondary schools for setting up of about 1,000 science clubs. The activities conducted in the science clubs are of two types: (*a*) paper reading, simple symposia, seminars, essay competitions, debates, lectures and film shows and excursions, and (*b*) activities which involve doing something with hands and are of a creative type such as collection, preserving, specimens, preparation of graphic materials, preparation of models, performing new experiments both individually or in groups, making improvized apparatus, conducting simple investigation and understanding creative type of projects. The State Institute of Science Education have been set up in 11 States in the last few years with the grant from the Union Ministry of Education. These institutes would mainly concentrate on the in-service education of science teacher: (*a*) 10 weeks refresher course for science graduates, and (*b*) 9 months condensed course for science graduates so that their content is brought up to B.Sc. (Hons.) level. These institutes are keeping in close touch with the NCERT and take its help and guidance.

In any programme for the improvement of science education, activization of teachers is of the highest importance. In order to provide opportunities to the teachers to increase their subject-matter competence the University Grants Commission initiated a programme of summer institutes for school teachers in 1963. So far 292 institutes have been

organized at which over 11,400 teachers have been exposed to newer concepts, techniques of teaching and improved subject-matter. Before the initiation of the programme, the schools have been cut off from the stimulating effect of successful contact with research scholars for advancement of their knowledge. In many schools the courses, most inadequate in mathematics and sciences, had grown sadly out of date and failed to give the students an adequate picture of current thinking and problems. The universities and colleges therefore found it necessary to begin their instruction at a lower level than should be necessary and superior students had been frequently forced to spend more time in acquiring general education that was not necessary. The institutes have been successful in narrowing the gap between the school teachers and university scholars and scientists on the other. Reasonably effective application of instructional materials is taught in the institutes would require the supply of important textbooks, adaptation and preparation of newer curriculum materials, supply of films and teaching aids, laboratory kits and equipment and most important of them all, professional guidance. The sponsoring agencies, *viz*., the NCERT and the UGC have worked out the details of a suitable follow-up programme so that the institutes can have the desired impact. By the end of the Fourth Plan about 40 per cent of the science students in the country would have learned new science and mathematics.

The University Grants Commission realized the need of revising drastically the undergraduate and postgraduate curricula. The UGC has brought out reports of the review committees in several science subjects which give an account of the courses provided by the universities and have made specific recommendations for the improvement of curricula. These reports have been of real value in helping many universities in reorganizing and updating their curricula. At the recent bi-national conference on chemical education, a survey of the teaching of chemistry in the universities has been made and measures suggested for the improvement of the level and content of university courses so as to bring them at par with those in the scientifically advanced countries. The report entitled "Chemistry : Design and Innovation" is under print. It is planned to organize similar conferences in other important disciplines and bring about necessary climate for improvement of curriculum and instruction in the Indian universities and colleges.

The University Grants Commission has also given substantial assistance to the universities during the last ten years towards the development of their university science departments. Funds have been made available to the undergraduate as well as postgraduate colleges for improvement of their laboratories and libraries. The

Commission has also initiated a scheme of retraining of college teachers through the programme of summer science institutes and academic year institutes. The objectives of these summer institutes have been to provide supplementary training to the college teachers and to strengthen their mastery over the subjects and also to refresh their minds with new ideas and to make them familiar with the recent advances in their respective fields. During the period 1964-69, 250 institutes have been organized which have been attended by about 10,000 teachers. The Commission has also initiated a scheme of research participation which enables the college teachers to undertake research projects on their own during the summer vacation or during academic year. The scheme has been widely welcomed and some useful publications brought out by young research workers. Similarly, the UGC has also been holding special institutes on an all-India basis for gifted students so as to accelerate the rate of progress in their academic fields.

Planning for Future Progress

As would be seen from the preceding paras that considerable effort has been made for the improvement of science education in the schools and colleges. Despite this, much more needs to be done so as to bring the quality of instruction in this country at the same level as in scientifically advanced countries. As a result of the survey of various programmes the following factors need immediate consideration. First and foremost of these has been the lack of suitable textbooks both at the school and college levels. The progress in the preparation of textbooks highlighting new concepts at the school level has been exceedingly poor and has seriously retarded the proper promotion of scientific principles and ideas. Because of the change over to the regional media of instruction, the books prepared centrally would only have a reference value and a number of States are going ahead with the preparation of their textbooks disregarding the efforts made by the Central agencies. The task of preparation of suitable textbooks has therefore assumed a new urgency. In this connection, the experience of India's neighbour China might be of some interest. During 1949-55, more than 3,000 titles of the Soviet scientific and technical books were translated and a total of more than 20 million copies were published. Since the organization of textbook writing programme centrally directed and implemented by the universities is time consuming and needs considerable financial outlay, it might be worthwhile to consider whether for meeting the immediate needs it might be desirable to adapt the important textbooks for meeting our specific requirements. Moreover, the production and writing of textbooks of high value in science subjects needs to be given the same amount of recognition

is accorded in the USSR where a successful author can get sufficient royalties consequent upon the approval of the text by the Governmental agencies. Projects of curriculum revision such as BSCS, PSSC, Chem Study, CBA and SMSG in the USA have been produced with assistance from the National Science Foundation amounting to millions of dollars. Similarly, the Nuffield Foundation in UK have also brought out some very valuable text materials. In view of the financial stringency, it might be easier to adapt these materials for use in our schools and colleges.

As a result of the various reprinting programmes with the subsidy from foreign agencies, it has been possible for the university teachers and students to own books at a low cost. Many of these textbooks are irreplaceable in the value of the content and the style and indicate dedication and sustained efforts of the authors. The programme of development of textbooks for meeting the internal needs is essential because of difference in the pattern and duration of education. It would be necessary to involve top-ranking scientists in the writing of monographs and science textbooks aimed at meeting our requirements. Such a programme would have to be imaginatively handled since very few of our top researchers would be willing to take except perhaps superficial interest, in the writing of text materials and reference monographs unless it is made financially rewarding as well as due recognition is given to them for this national effort. It can be emphatically stated that there is no dearth of talented writers in our institutions of higher learning who would be willing to undertake this as a national task. Many of these often have been approached by reputed foreign publishers and have to their credit a number of important titles, published abroad. Although some of our well known scientists have been involved in the textbook writing programme for the secondary schools the progress has been slow because many of the scientists have found it difficult to undertake this work on a full-time basis. Fortunately, an important feature which distinguishes this country from advanced countries has been the keenness on the part of our top ranking scientists to get involved in the activities of curriculum improvement both at the school and college level. With some central initiative and support, it should be possible to develop materials which would revolutionize the teaching of the sciences and thus strengthen the base for strong scientific research in the next 10 years to come.

Another serious drawback has been the non-availability of teaching and instructional equipment at the school and college level. To make the adventure of science come true school science apparatus or at least tools should be made available cheaply and in profusion and not in the

fashion of standardized experiments only. It is only through these things that a mature and well grounded teacher can make science instruction exciting and informative. It is important to remember that instruction in science does not always need expensive apparatus. In a number of cases, scientific principles could be illustrated with very simple instruments made with indigenously available materials. There are a number of toys which demonstrate important scientific principles and could form a regular item of equipment in most of our schools. Similarly attempts will have to be made to manufacture on the lines already marketed in the advanced countries educational science kits particularly at the elementary and junior high school levels. These toys and kits when used properly could provide opportunities for younger students to actively participate in science. It is, therefore, of the highest importance that immediate steps are taken for fabrication of cheap and inexpensive equipment in kit form right from the elementary to the high school level. Such an experiment was tried in Brazil with notable success, wherein such kits were marketed throughout the country at all department stores including drug store. With the proper use of such equipment a student on completion of his education in sciences at the high school level would be able to appreciate the importance of science for understanding modern world, methods and procedures of science for their value and discovering new knowledge.

In our universities and colleges, the laboratory has been used not excite the imagination of the students but for performing standardized sets of experiments. In a number of cases with the stereotyped equipment, which has been relatively unchanged for several years, the curiosity of the students gets dampened. Some of the procedures have to give way to newer emphasis on open-ended problems that challenge his interest. It should be possible to reshape the laboratory work so that students are able to learn in depth a fewer acknowledged concepts. In order to bring about this important element, it would be necessary to change the concept of the laboratory and make laboratory exercises completely optional not to be counted for evaluation purposes. Such a laboratory could ideally contain various kits and components and the students could then be given projects of their own choice so that they could fabricate their own equipment. At present, most of the manufacturers are marketing routine equipment which do not conform to the specifications and standards. Short of setting up a central agency, as was recommended by a committee on Plan Projects, it should be possible for the Government to stimulate fabrication of proto-type equipment at many of the renowned educational institutions to be later produced on a commerical scale either in the public or private sector.

Because of the paucity of equipment a number of students in the colleges and universities are not even allowed to touch and use even relatively inexpensive equipment. If such equipment is made available in the form of kits, it would enable the students to undertake the fabrication of such equipment as a part of their regular course work so that they are able to understand the underlying concepts and principles as well as to use the equipment without any fear.

A notable lack in the modernization of science instruction has been the near absence of quality journals devoted to science education. In many advanced countries, there are a number of renowned journals through which a teacher is able to keep in touch with the latest developments in his field. Although there are a number of professional journals in this country, these have not been able to meet this specific need. A beginning in this direction has been made by starting a Science Resource Letter under the auspices of NCSE which is being distributed to more than 22,000 teachers and institutions. It is therefore high time that journals in various disciplines are started which would cater to the needs of teachers in their disciplines especially at the university and college level. In the beginning such journals could be centrally assisted and later made a financially self-supporting operation. The success of the journals would also depend upon the existence of strong professional body of teachers. It is therefore necessary that enough governmental support is given to the existing professional bodies for enlarging the scope of their activities or for setting up new societies with definite objectives.

At least for some years to come, the country would have to depend on the import of some sophisticated equipment which is at present being used in this country only for research but which in many cases become a normal tool at the undergraduate level of instruction in the advanced countries. In order that our students are able to gain first-hand knowledge in the use of these instruments, it is essential to provide facilities at selected Centres which could be jointly sponsored by a consortium of institutions. Simultaneously a programme could be devised for building up of such equipment for use in the regular classroom instruction as well as research. Assistance could also be given to university institutions and colleges for developing new instructional aids and equipment. The project could be varied in scope from the design of a very simple instrument to a creation of a complex electronic machine. One is often distressed to find the lack of elementary workshop facilities in a large number of educational institutions. It is imperative that some kind of a massive programme is launched so that most of our educational institutions are given financial assistance for the

creation of workshop facilities. With imagination and some thought it should be possible to make workshop experience as an integral part of a science teaching in our colleges. The importance of workshop has been pointed by Dr. D. S. Kothari, Chairman, UGC in his various addresses and also highlighted in the report of the Education Commission.

Extensive use of audio-visual media, such as films—16 & 8 mm has to be made in view of shortage of qualified teachers and equipment. Within the country we have expertise to produce various single concept films using indigenously available resources so that the teachers are able to present ideas and concepts in a more effective manner. A large number of such films are available in the advanced countries and could be suitably adapted to meet the needs of science instruction in the schools and colleges. Our country which has been one of the foremost in the production of feature films could utilize its resources in the production of science teaching films to suit a variety of purposes.

Science Teaching Centres

Steps are necessary at this stage for bringing the community closer to the understanding of science. In this connection, it may be noted that China during the leap forward increased its science enrolment several fold in an effort to bring science down to the level of the masses. China regarded this as a form of an investment in the future of the nation's dream of scientific and technological accomplishments. In a country like ours, there is a need for having science centres which could have necessary scientific equipment to be shared by the whole school system and other neighbouring educational institutions. The centres could promote the understanding of the science to the students, their parents and public at large. Such facility could be organized for those who wish to learn and who are desirous of being exposed to latest development of science and technology through audio-visual and other means. Such Centres could also conduct integrated research programmes and take measures for the development of new experimental kits and teaching materials. In the United States, one of the remarkable developments has been the rapid growth in the number of college and university sponsored science education centres. There are now more than 50 centres and the number is still growing. A typical centre involves museum, science curriculum materials, major equipment and aids, displays, regular scheduled workshop for in-service science teachers and visits to centre by groups of students and teachers. The centre could also constitute a regular part of physical materials utilized in the preparation of pre-service teachers. It could spend a portion

of its time conducting in-service classes for science and mathematics teachers in nearby communities. A notable beginning in this direction has been made through the establishment of a Community Science Centre at Ahmedabad under the leadership of Dr. Vikram Sarabhai, Chairman, Atomic Energy Commission. Japan has also set up several such centres, which indicate an improvement over those in the United States in that they are totally financed centrally and are equipped with all the latest curriculum materials and equipment produced all over the world. At one of the centres which the author visited, the secondary school teachers were being acquainted with the use of laser. The centres in Japan are used throughout the day by the students from various schools as well as teaching staff. It is felt that a number of such centres should be set up in different parts of the country provided there is a local commitment in the form of material contribution for meeting the maintenance expenditure of the science teaching centre. With careful central planning and assistance there a number of individuals and organizations would be willing to extend cooperation in the setting up of such centres for undertaking the task of bringing science closer to the community.

In the foregoing paras an attempt has been made for identifying some of the gaps which exist in the various programmes being implemented by the Central as well as State agencies. The success of a number of these activities would depend on the proper planning of the governmental effort and through identification of suitable institution and personnel for execution of these activities. A number of these programmes have to be implemented on a project basis and the existing agencies because of their limitations may not be able to implement some of them, without substantially altering their charter. In view of the importance of science education, it is felt that there is now a need for a national agency like the NSF of USA which would undertake the implementation of the programmes in the field of Science Education right from the primary to the highest level. Much of what has been said in the article would not be a success, unless the persons selected for carrying out different programmes are highly motivated and are ready to face the problems in science education with a determination and firm faith in the future of this country.

SCIENTIFIC RESEARCH IN THE UNIVERSITIES

B. R. Seshachar

THIS essay presents a few problems of Science Training and Research in our universities. It assumes the need for such a presentation and hopes that it will help in a reorientation of our policy in regard to scientific research in the country. It proceeds to declare that the situation in our universities is critical and that a remedy is not only necessary but also urgent. It goes on to argue that without a substantial commitment of our State and Central Governments in the working of our universities in the furtherance of science, both teaching and research, it would be difficult to imagine how this nation can become an effective participant in the world's march towards material progress. And finally, it makes a few suggestions to remedy the situation.

It will be remembered that the universities were among the first organizations which sponsored scientific reseach in India. Some of our universities are quite old and at least three were started over a hundred years ago. Several of them were manned by British scientists and scholars who laid the foundations of scientific research in the country. Notably, the departments of science in the Madras, Calcutta, Allahabad and Panjab Universities played a pioneering role in scientific research in the country.

Recently, however, the universities have come in for criticism, that the levels of teaching and research have fallen and standards in many of them are low. Much of this could be true. By and large, the great intellectual giants who inspired generations of students in our universities in the past have passed and their place taken by persons whose intellectual calibre or devotion to the cause of learning leaves much to be desired. The important reason for this is the phenomenal increase in the number of universities in the country, especially since Independence, and the general inability on the part of governments and the universities to find adequate resources for supporting them. Since 1947, our universities have grown from 25 to more than 80 today (including the 'deemed' universities). Everyone of them has been started under State patronage and depends for support on State finances, and it has been a consistent experience that the enthusiasm shown by State

governments in starting new universities is rarely matched by either the desire to provide funds for their growth or the resources needed for their development. The result has been a fungal proliferation of higher education in the country without regard to the maintenance of quality. While this has had deleterious effects on almost all branches of learning, those on science teaching and research have been disastrous. We have, in several universities, affiliated colleges doing post-graduate teaching with little or no equipment for modern work and few library facilities. The teachers are not involved in research and the colleges are just workshops where M.A.'s and M.Sc.'s are turned out. The involvement of the university in these colleges is at best marginal and there is no overseeing of standards to speak of. Scientific research is expensive and needs newer and more sophisticated apparatus, tools and chemicals. Even some of our progressive universities can hardly afford them. Under the circumstances, it has not been possible to modernize post-graduate curricula in many universities or encourage modern research, especially in borderline areas (where most modern research now lies). This is also the reason why our young men go abroad for higher studies at even the doctorate level and why, having done so, discover they do not fit into the scheme of things that obtains here.

The result of this is that in many universities there has been hardly any breaking of new ground. The tools are old, methods are ancient and it is difficult to expect that under the circumstances, advances could be made, at least in the experimental sciences. The intimacy of the relationship between scientific equipment and break-throughs in scientific knowledge is undeniable and it is not accidental that the USA which has pioneered scientific instrumentation is also the country which is in the vanguard of scientific advancement and progress.

The situation in scientific organizations other than in the universities is much better, and curiously this has added to the difficulties of the universities. Most of these organizations, like the Council of Scientific and Industrial Research, Atomic Energy Commission (including the Tata Institute of Fundamental Research), Indian Council of Agricultural Research, Indian Council of Medical Research, Defence Science Organization, are, or should be, project-oriented institutions whose resources are directed towards the solving of specific problems of the country. But quite a few of them are engaged in routine studies, in training students (in one CSIR laboratory, it was reported that over 70 persons are working for their Ph.D. degree) and in basic research much of which has little relevance to the projects the

laboratories are supposed to undertake. This has called for criticism in the country. Having procured much valuable equipment, ostensibly for solving problems of applied research, there is a feeling that it is being used by the laboratories for the conduct of basic research of the kind that should rightly be done in the universities. This has all the appearance of discrimination and the universities appear to have the right to feel so.

Planning of Scientific Research

Indian science suffers from the manifest disadvantage of growing in an unplanned manner. Sponsored as it is by different agencies, and often supported by different ministries of Government, not only is one agency unaware of what the other is doing; very often consequent on this, one is doing what rightly some other agency should do. There has also grown a kind of rivalry between universities on the one hand and the national laboratories and institutes of research on the other, to the distinct disadvantage of both, perhaps more to the former.

This is all the more tragic because funds for research come only from one source in the country—the government. That we have not been able to assign priorities to one or the other of the different areas of scientific research, has been one of the major causes of the present sickness of Indian Science. Under the plea of freedom for the scientist, there has been such a confused and amorphous growth of science that it has not been possible to harness either our scientific manpower or our resources to constructive endeavour. This again is due to our avidity to imitate western methods, especially those of the U.S. It is silly to think that we can do what the U.S. is able to. We will end up in confusion and haphazard growth.

Let me illustrate what I mean. With the U.S. offering extensive opportunities to scientists all over the world for advanced research, Indian scientists, especially the younger ones, have utilized these opportunities to a great extent. In fact, it is almost impossible for a promising young person from a good university, with a Ph.D. or even M.Sc. degree in basic sciences, not to be able to get into a university in the U.S. for either post-doctoral or doctoral research. This is often arranged at a personal level and entirely without reference either to areas of research that need strengthening or opportunities of employment in the country. The result is specialization in such fields as molecular biology, high energy physics, zeta functions, cellular physiology or some abstract or difficult area of physics, chemistry or biology. He demands as a price for his return, not only a job with a high salary

(equivalent in rupees to what he was getting in USA; he does occasionally make a concession that he is prepared to accept some 10 per cent less) but also wants facilities for continuing the work he was doing in the USA, including equipment, which is often very expensive and requires foreign exchange. If some one tells him that his demands are unreasonable, that it is not only impossible but also unnecessary to develop these areas of his interest in the country, he lets out a howl that talented young scientists are not wanted and threatens to go back. He has generally established enough contacts here to be able to accuse the senior scientists and administrators of suppressing talent, of animosity towards young people and generally of encouraging the brain drain. Today, the country is entirely demoralized by this cry and the scientist and administrator, head of a university department or vice-chancellor of a university is held to ransom by these young men who, having made choice of their fields of research and universities in the United States without any reference whatsoever to the possibilities of their absorption in, or usefulness to the country, make impossible demands. Consequent on these demands having been conceded in the past, under the plea of support to young scientists, several organizations and universities in the country are burdened with such people as are making little or no contribution to basic or applied research in the country. More, these young men have, during the years, built around them whole complexes and mini-organizations involving much equipment, expensive material and scientific and technical assistants. That this happens in universities where basic work could, to some extent, be supported, is bad enough.—heaven knows they can hardly afford it. That this should be permitted to happen in laboratories and institutes where admittedly research oriented towards industrial growth and development should be conducted, is tragic.

The present sickness of Indian science is not a little due to this. We not only do not have the right people, in quality as well as in numbers, engaged in solving the problems of the country; we have wrong people in these places, in positions of authority and influence, so that no positions are available for the right men when they come along. In this country when one gets a foothold in a university, a government department, a CSIR institute or a laboratory of one of the other councils, one is there almost for life: nothing can dislodge him, neither his incompetence nor his inability to serve the needs of his organization. So the stalemate continues and we have the spectacle where young scientists legitimately feel discouraged. Here is a situation which has largely resulted from imitative methods, whereby India with money and men woefully short, is trying to do things which only the USA can afford to, of permitting complete freedom to scientists to do what

they please, under the belief that this leads to creativity in science. Even the USA is now discovering that she is unable to afford this luxury and is trying to contain these trends. In India, it has led to a disaster.

It is a good thing to look closely into what each of these young men has done, how relevant it is to the nation, and where he can be fitted. It is necessary also to warn them that adjustments are needed and their survival in this country would depend entirely on their adaptability, not only to the conditions obtaining in the country but also to her needs. Those of them that cannot exhibit the adaptability should be permitted to go out. It would be a good thing for them as well as for the country; good for them, because, in some other more affluent country they might really be able to make a creative contribution and India would not have stood in their way; good to India because while she might have lost a few scientists, she would not have to incur more expenditure in supporting an irrelevant project and in the process, block some desperately needed research or development.

Role of Universities in Teaching and Research

Among the first things we must recognize is that the university is an educational institution. Its primary role is to impart training. Educational programmes must constitute a major factor. There might reasonably be a difference in emphasis, whether in a country like ours, the emphasis should be on under-graduate training, or training in the development of special skills, or post-graduate or creative level training, but in every case, students are involved and in the process, a transmission of knowledge. An undue emphasis on non-university organizations, in the name of applied research, especially if it brings in its wake a neglect of the universities, will only result in a drying up of the springs of creative effort. The answer lies, not in these non-university organizations themselves taking over the functions of training but in strengthening the existing universities and enabling them to function more effectively. The two sets of organizations,—the project-oriented institutions on the one hand, and the universities on the other,—should work in collaboration with one another so that the basic training in scientific method obtained in the latter could be made use of in solving the problems of the former.

'Product values' and 'Process values' of Scientific Research

It has long been held that basic research can be carried on only in the universities and this is intimately associated with the important

function of training scientists for research. This is largely correct and if the universities do not involve themselves in this, no other organization can. Moreover, the freedom of the university scientist and the autonomy the universities themselves enjoy, are the necessary preconditions for the creation of new knowledge. Actually, the problem of the distinction of basic and applied research has recently been posed in a slightly different manner and helps to emphasize the complementary nature of the two activities. The distinction between 'Product values' and 'Process values' of scientific research has come into sharp focus and has some relevance even in a developing country like ours where it is neither altogether possible nor entirely necessary to make such a distinction. 'Product values' of scientific research relate to the benefits accruing from the information produced,—benefits to defence, health, agriculture, industry and technology, and generally to economic growth, evidently synonymous to what has been regarded as applied research. On the other hand, 'Process values' of research accrue from the activity of research itself without reference to the information it may produce. The inestimable value of teaching and training students, the exciting experience of working with new equipment and the stimulus for increasing scientific capability and analytic approach to problems of life are only some of these 'Process values'. The presence of highly qualified scientific personnel in a certain area would itself act as a stimulant to society and would mark it off from any other area. It is this that makes a university town so very different from an industrial town.

But research is expensive and basic research is perhaps even more so; what does one do in the circumstances? Do we provide the required conditions in the universities or shall we withdraw postgraduate teaching and research from such institutions? Here is where proper planning would not only be helpful but vital. We should have clear views in regard to our goals and pursue them diligently. A haphazard growth in science and science training without clear sights will result, as I claim it has already done, in great frustration among our young men. The example of engineering education has been cited recently. But it is not nearly as well known that it has happened in some more conventional scientific fields as well. Geology is one such. I recall the great enthusiasm with which Geology departments were started in some universities not so long ago,—even in some newer universities,—without proper appraisal of the job opportunities for qualified geologists or the absorption capacities of our industries which could employ them. The result has been a proliferation of geologists who cannot find employment. It is unfortunate that some basic studies are wanting in such areas. Even if there were, it is doubtful if universities would pay heed to them. For, it is a matter of prestige

for universities to start new departments. That in the process, they are setting up a chain-reaction of creating more unemployment, does not appear to bother most universities.

An answer to this is a reconciliation, however unpalatable, to the situation that not all universities can do as well in all fields, that it is neither necessary nor feasible to develop all areas, that with money and men woefully short, many of our universities must remain weak for a long time, and that a practical salvage operation should be conducted by which one or a few active and vigorous departments be picked up for special assistance so that in our desire to retrieve all, we do not lose the few good ones. This is a difficult decision to make, for who is the great vice-chancellor who will acquiesce to a shutting down of a few departments in his university even when he knows they are ailing? Where is the State Government which will permit a university in its area to a self-effacement of some of its problem departments? It is no shame to own up to a real weakness; rather, it is courage to do so and declare that while a university constantly strives to improve, it takes both men and money to do so, and in the absence of either in sufficient quantities, it is inadvisable to maintain no more than a semblance of quality. The need of the hour is not fission but fusion, the pooling together of scarce resources, of expensive equipment, of qualified teachers, in order that standards are maintained and quality prevails. This is happening in a country like the United States, whose commitment to science is unquestioned and whose scientific progress is excellent by any standards. There are several universities in that country where, consequent on recent cost-cutting, facilities in neighbouring universities are shared by one another with benefit to all and detriment to none. This is not only possible in India but even necessary for the very survival of many universities.

University Research

What type of research should university scientists pursue? Here again, as in many other things, it is our wont to cite the example of other nations and quote foreign observers. There are those who make a fervent plea for fundamental research in developing countries and who would like to see this done largely in the universities. On the other hand, there are many for whom India's economic and industrial development could serve as a model among developing countries and who would see a great deal of effort,—in fact, massive effort,—put into the direction of economic development. There are powerful arguments for either of these views. That the universities, by virtue of their twin functions of teaching and research, could catalize scientific effort as

no other organization can, is a truism. At the same time, the idea that competent scientists working in the universities cannot devote some of their time in solving the economic problems of our country appears, at the most generous, a dissipation of valuable talent.

Here, it might perhaps be interesting to note that even in the USA many university scientists are being enjoined to engage themselves in applied research. Not all can solve the problems of modern living, —pollution of our air and water, urban development, overcrowding and so on, but several can. And there are many areas of less striking and spectacular impact on our economy, in the fields of physics, chemistry and biology, and in their interdisciplinary areas, that could constitute powerful attractants to the talent of our university scientists. If this could happen in the USA where university scientists are being asked to enagage themselves in "Programmatic Research", its relevance to a country like India is even greater. For, ultimately, however eminent a scientist is, the people,—any people,—have a right to ask of him, "what have you done for us"? And in fact, the greater the scientist, the more pointed the question, for the feeling is legitimate that with so much talent, so much more could have been done for the country and its people.

When I speak of research of relevance to India, I do not have in my mind only the problems of food, population, shelter, clothing, health and sanitation, etc., that confront us. It is true they are of imminent interest and if we do not solve them, it is very unlikely we will survive as a people. But mere survival is no special attraction if intellectually and scientifically we are dwarfed. Science and its application must pervade the land, must contribute to our growth and development. In this development, the choice of priorities is difficult but nevertheless should be made. To an extent, it is being made. The research councils in the country are handling problems that have both short-range and long-range applications to agriculture, medicine, industry and technology; by and large this has been satisfactory. However, several competent scientists and science analysts in India and abroad have honest doubts in regard to the money we are spending on "Big" science. Another criticism that these scientists have no great opportunities of imparting their knowledge and skills to others, as they would have been able to do, had they been working in universities is also valid. That they are specially well looked after, that their laboratories are particularly well endowed are also matters of envy to the others.

This imbalance in the support of scientific research in the country in the different organizations is a real threat to a unified approach to

the development of science in India. It is not merely the emoluments of scientists working in different organizations,—they are important but not overly so, it is also the prestige afforded to these organizations, a prestige that is a mirror of the personalities involved and the extent and durability of their influence in Government. The circumstance that scientific research is supported by organizations under different ministries of Government should not be used to the disadvantage of some of them. As it is, the university scientist is indigent, as compared to his affluent colleagues holding positions in prestigious organizations, —the Atomic Energy department, the CSIR, the ICAR and others. A large share of blame for this imbalance should belong to Governments,—at the Centre and the States,—who, having permitted university expansion more on political than on educational grounds, now find themselves in dire straits, where many university science departments are unable to exist, let alone expand.

What is the remedy? I venture to make a few suggestions:

1. There should under no circumstances be a further expansion of our universities. We should spend our energies and resources on consolidation rather than expansion.
2. We should identify departments in the existing universities which show some strength and vigour and support them by providing assistance for equipment, staff, library and buildings. The University Grants Commission already have a scheme of Centres of Advanced Study and this should be expanded.
3. Universities should really be made all-India Institutions. With all our avowals of national integration, we remain a much divided nation. There are few universities in the country where either students or teachers are drawn from all over India. Even the "Central" universities are coming under the clear influence of the regions where they are located and are rapidly losing their national character. A supreme effort should be made to retrieve the situation and permit talent to come into these universities,—in fact into all universities,—regardless of region or language.
4. Education should no longer be the first area on which financial cuts are imposed. Many universities find themselves in situations where they are unable to exist, let alone expand, and at least at the post-graduate level and for research, adequate assistance should be provided.
5. The concept that each university science department has a fixed number of teachers of each cadre should give place to one

of flexibility. Brilliant men should be attracted to the universities. In other words, university departments should be built around men.

6. Outstanding scientists in the universities should have opportunities to work at world centres of research. University scientists have at the moment few such opportunities.

7. A central, and perhaps several regional committees, should be set up to co-ordinate scientific research among the universities, government institutions and the laboratories of the CSIR and other councils. One of the ills of Indian science is the lack of this co-ordination. Much unnecessary repetition and duplication could thus be avoided.

THE REQUIREMENT OF A SCIENTIFIC ORGANIZATION FOR DEFENCE

V. Shankar

DEFENCE today does not consist of crossing of swords with one's adversary except, of course, in the metaphorical sense nor of throwing javelines at one's opponents; it involves wholesale mobilization of the country's resources to fight the enemy. Before the First World War, the battles were generally of local character; they affected a limited section of the population and a limited area; guns, cannons, ships, cavalry and infantry aided by arms and ammunition and technical manoeuvres were all that were required. The First World War brought in trench and submarine warfare and saw the beginnings of tanks and military aircraft. It also made war a war of nations which involved huge populations and large areas; the strategy became global, even though earlier, for instance, in the Seven Year's War and the Nepolieanic War, battles were fought outside the main theatre but the fights were local—though the general direction encompassed the whole world. The Second World War made war a gigantic operation involving not only nations and countries in the geographical sense but their entire populations and their entire resources. The directions of military strategy became more closely global and the range of armaments included bombers and much faster fighters, though both still depended on piston engines; cannons, bombs and guns were their equipment. Big battle ships provided the focus of naval forces and they were equipped with long-range guns and anti-submarine devices. Submarines and pocket battle ship—a German invention—menaced the Sea-lanes. Big tanks and machine guns and powerful and long-range guns made ground war-fare a more death-dealing undertaking on both sides.

After the Second World War sophistication has advanced even further. Sub-sonic and super-sonic aircraft based on jet engine have become the order of the day. Electronic devices have both original and counter effects. They have added precision to lethality. Missiles of various types, air to air, air to ground, ground to air, surface to surface, ship to ship, and anti-tank missiles have become the common possession of military forces of many countries. Naval strategy

under these conditions has been considerably revolutionized; small speedier vessels with effective fire-power of diverse types have become popular; naval aviation has acquired new roles; maritime reconnaisance and anti-craft defence have become much more sophisticated. Mobility and manoeuvrability have acquired new importance. Arms and ammunition have also become more modernized. In short, science—ballistic, metallurgy, engineering, electronics, geological, chemical, aeronautical, physical—has become not only important but vital to defence; and if we consider the nuclear field it has not only become decisive though deterrent at the same time but it has also become so much more deadly.

We have thus travelled a long long way in scientific aid to defence from the use of mere gunpowder in military warfare 700 years ago. What should have been merely an instrument of the welfare of mankind have become a menacing cause of its destruction. Yet as long as the threat to peace remains for nations individually or collectively and as long as nations cannot evolve an unfailing system of collective security, science will remain an indispensable agent and a very vital instrument of national defence. And it would not be so only in the specialized or exclusive defence field but in virtually every technical branch of national life for modern warfare cannot but be total warfare and would involve the mobilization of country's industrial and all other technical resources. Thus while a scientific content of the military machine is a *sine qua non* of any defence system it cannot but be an aid to defence in other channels of national activity. Even the ordinary citizen today has to be much more science-oriented than he was before and it might even be argued with considerable force that in the modern world no nation can give of its best whether in the defence field or in peaceful pursuits, without its population being largely science-minded and the alumni of its schools and colleges acquiring an academic education with sufficient scientific content.

If this analysis of the role of science in modern defence is accepted, it goes without saying that conventional or sophisticated branches of defence forces must be assisted by quality research, both fundamental and applied, and based on actual requirements determined by defence plans and strategy. Such research activities have to be thought out, planned and implemented on a broad basis, embracing so many different branches of science and have to benefit from scientific developments not only in the country concerned but throughout the world. And since it is a notoriously exclusive field, highly security-conscious and publicized within very narrow limits, its activities have to be more or less self-contained and must have in them the seeds of their own growth and developments. This involves not only bands of dedicated

and highly qualified scientific research workers but also up-to-date and highly equipped laboratories with the means of experimentation and trials at their disposal. These include not only experiments and trials in the laboratories but also in the field and would cover field ranges, underground arrangements and tunnels in which trials and experiments can be held. What is also equally important is that field experience, knowledge and requirements must continuously flow to the laboratories and scientific development must percolate to the field and there should be complete understanding between the scientific and military branches of the defence machinery. The scientific personnel must obviously be not only of the highest quality attainable but must be contented in order to be able to give of their best and must have a practical outlook to be useful. What is also very important is that as in so many other aspects we should be prepared for both successes and failures in the pursuit of research and recognize that in the failure of today we may be able to build up the success of tomorrow or the day after. Above all this research has to be purposeful, scientifically organized, highly performance-oriented with an effective system of incentives and very systematically coordinated and controlled by persons who have a broad vision, sympathetic imagination and team spirit apart from their technical or administrative qualifications. In the circumstances while it is obvious that these activities must be predominantly controlled by scientists, they must be influenced by military and administration experts.

India has been rather late in recognizing this role of science and giving shape to that recognition. Scientifically organized defence science research is not more than a decade old. Even then it has not enjoyed either the autonomy or the freedom from external control which it deserved. Nor has the machinery for coordination or planning, in alliance with the military branches, been systematically worked out, let alone introduced and effectively implemented. What is immediately required is to recognize its autonomy and inter-service role and separate it from being a mere unit of the Department of Defence Production. Its role is not merely to help in the production of defence equipment but also to aid the military branches in thinking, in planning and in advising on scientific aspects of defence planning and strategy. There is also no getting away from the fact that whether we look at it from the point of view of its adequacy or its quality or its equipment or the scientific manpower available to it or the career angle for that manpower, there are deficiencies to be found everywhere. With us self-sufficiency in a defence equipment has become a slogan though it is repeated with so much thoughtlessness as to give the appearance of being an article of faith. But such repetitions are deceptive and apt to mislead. The

fact is that without very substantial advance in scientific research we cannot succeed in being even half self-sufficient, let alone being near self-sufficient or fully self-sufficient. What is required as an initial start to scientific reorganization in its whole range of activities is to have a small businessman-like committee of scientific experts, defence experts and top administrators—not more than two or three of the first, three representing each service of the second category and one or two of the last, to lay down the requirements of defence in the scientific field.

Once these broadlines are laid, a Committee of Scientists should assess and submit to Government a list of requirements in the way of laboratory equipment, scientific manpower and supporting industrial and other organizational efforts that would be required. To the extent that the requirements are met by the existing institutions it is all to the good but expeditious efforts should be made to make up the deficiencies with a view to ensuring that it will not take more than 10 years for our scientific organization to work up to a stage when it would be able to satisfy most of the requirements of Defence Services in the way of research and application of that research in the field. We do not have even 10 years to lose but we have to look at the practical possibilities and from that point of view, it seems that no substantial progress can be made towards the ultimate goal except over a period of 10 years. All scientific personnel should be found for the laboratory on a priority basis and they should work under conditions of remuneration incentive and performance assessment which would make them a contented and efficient body dedicated to the task before it and not eager to look elsewhere for prospects of promotion or monetary gain. As regards the head of the institution, obviously it must be a scientist of not only all-India standing but international repute because in many fields contacts with outside scientific world would become necessary and the head of organization should be one who would command instant universal recognition and would not justify his credentials.

Obviously, the link between this organization and other scientific institutions in the country would have to be kept close and businesslike. There is no room for rivalries and jealousies of which non-scientists do not necessarily hold monopoly. In fact, from my own experience I can testify to the fact that scientific branches are becoming more and more specialized and the heads of those branches develop a parochial patriotism which it is very difficult for any one to circumvent in the interests of larger objectives and larger aims. That is why I have laid stress on the team spirit as a more important factor for the

selection of personnel. In the world of today and in the light of our own development, it is obvious that we shall have to depend on imports of different kinds of equipment and raw materials. The organization should not lack either and keeping in view the ultimate savings in foreign exchange that would result from developing indigenous sources, the increased outlays in foreign exchange in the initial stages should not be grudged.

The organization should not be linked to any particular department of the Ministry of Defence but it should be kept as an inter-service organization feeding not only the three services but also Defence Production and Defence Supplies. The work of the organization should be supervised by a high-level but small committee of the Ministry of Defence presided over by the Defence Minister and having as its members other Ministers in the Ministry of Defence concerned with the three Services, Defence Production and Defence Supplies, the three Service Chiefs and the three Secretaries. The head of the scientific organization would be the Member-Secretary. This committee should meet periodically at least once in three months to review the progress that might be made in prescribed fields and solve any difficulties and bottlenecks that might appear in the working of the organization or in its contacts with other scientific organizations. Whenever necessary for the latter purpose, appropriate heads of the institutions or Secretaries of the departments should be called in for assistance. I would similarly like the head of the scientific organization and his high-level aides to figure prominently in defence planning, under the Chief of the Staff Committee. Whenever scientific aspects of a high order are involved, of course, the Chiefs of the Staff should be free to consult the head of the scientific organization whenever they consider it necessary and request his presence to help them in their deliberations.

This is just a bare outline of what, in my judgment, is necessary to ensure that the Defence Services have an efficient scientific organization to assist them and that the defence research is imaginative, purposeful, scientific and highly organized. Nothing less than this would meet the situation particularly when it is our programme to make defence stand on its own legs. To grudge expenditure, autonomy and freedom which are essential for the success of the organization would be in a sense striking a blow at the root of our own defence. This is something which no responsible citizen can contemplate with equanimity and it is time public opinion understood what is involved and organized itself to secure that whatever is required in the scientific field for defence is made available with the least possible delay.

GOVERNMENT POLICY AND ADMINISTRATION OF AGRICULTURAL RESEARCH

M. S. Swaminathan

THE Agricultural Department in India had its birth towards the end of the last century on the basis of a recommendation made by the Commission appointed after the great famine in Orissa in 1866. The first major agricultural research institute in India, then called the Imperial Agricultural Research Institute, was established in 1905 because of a grant given by an American Philanthropist, Mr. Henry Phipps, to Lord Curzon, the then Viceroy of India. Thus, support for agricultural science has from the beginning been related to factors other than harnessing science for agrarian prosperity and for making agriculture into a paying primary industry. A little support for agricultural science was grudgingly extended, because it was felt that some research would be necessary to ward-off famine in the country. The progress till 1928 is best described in the following remarks of the Royal Commission on Agriculture, "In a country with such a long history, little surprise need be felt that a system of tillage based on experience should have reached a stage beyond which further progress was bound to await scientific discovery. The cultivator in the main, met new demands by breaking up new areas rather than by intensification of method. For further progress, he requires all the help which science can afford and which organization, education and training can bring within his reach." It was only after the report of Royal Commission on Agriculture that efforts were initiated to strengthen research and teaching organizations in agriculture and to establish an agency for coordinating and stimulating agricultural research. This coordinating body, formerly known as the Imperial Council of Agricultural Research and now the Indian Council of Agricultural Research, was established in 1929. Besides Government grants, its major source of revenue is cess funds.

Agricultural research in the different States of India usually centred round an agricultural college and research institute such as those established at Poona, Coimbatore, Kanpur, Nagpur, and Lyallpur (the last centre is now in Pakistan). These research institutions and colleges were controlled by the Department of Agriculture in each

State with both the Director of Agriculture and the Secretary to the Department of Agriculture having a say on most matters. The post of Director of Agriculture was usually occupied by Civil Servants or Administrative Service personnel and it is only recently that in several of the States technical men have been appointed to this post. The procedures concerning recuitment, transfer, promotion and other service conditions adopted in agricultural research institutes and colleges were the same as those prescribed by the State Governments for administrative departments. Thus, recruitment of scientists was done through State Public Service Commissions and promotions were invariably by seniority. Under such a procedure there were rather frequent changes in the jobs occupied by scientists and there was little scope for acquiring a deep knowledge or a position of authority on any particular topic or crop. The scientists under such an administrative set-up had to become generalists rather than specialists and tended to attach more importance to the administrative aspects of their work, rather than become wedded to academic and research persuits.

In addition to the efforts of the State Governments, the Government of India also instituted several research institutions in the field of agriculture, animal husbandry and dairying. After India became independent in 1947, many new institutes like the Central Rice Research Institute at Cuttack, the Central Potato Research Institute at Simla and the Sugarcane Research Institute at Coimbatore were all established to intensify research on these crops. Meanwhile, the various Commodity Committees like the Central Coconut Committee and the Central Tobacco Committee also established their own research institutions. Research on plantation crops such as coffee, rubber and tea were handled by the Ministry of Commerce and not by Agriculture. The Indian Council of Agricultural Research also initiated under its own direct control several research stations in the different parts of the country under a Project for the Intensification of Regional Research on Cotton, Oilseeds and Millets (known as PIRRCOM Centres). Thus, a net work of research stations had been established in the country both on commodity and on cross-commodity basis by the State Governments, Commodity Committees, ICAR, and the Agriculture and Commerce Ministries of the Government of India. Institutions like the IARI were directly managed by the Department of Agriculture and were vested with the status of a subordinate office. At the Central level, recruitment was done through the Employment Exchanges for non-gazetted posts and through the Union Public Service Commission for gazetted posts. All the financial and other rules of the Government of India were applied to these central institutes. Here again, as in the States, a scientist had seldom opportunities to get a better scale of

pay in his own field of specialization. He had to shift from one job to another to improve his economic position.

Because agriculture was considered more as a subject for the generalist rather than the specialist, research policies were frequently formulated at the administrative and political level rather than at the scientific level. Instructions were often issued for the popularization of methods which an important political or administrative leader might have observed during a hurried visit to a foreign country. Thus, prefixes such as "Japanese" and "Chinese" used to be attached to the methods of cultivation which the Government wanted to be popularized. The achievements of "Krishi Pandits" were considered to offer a good ceiling towards which agricultural scientists should aspire to rise. Much of the land and meagre financial resources of research institutions were diverted to studying all sorts of problems with a "magical" potential unrelated to real scientific advance. The administration-oriented structure of research institutions led to a strict compartmentalization of scientific disciplines. The different agricultural disciplines remained as parallel lines scientifically and converged only at the administrative focal point.

That the Government of India probably never conceived of agricultural research as a potent tool for achieving rapid economic advance is clear from the Scientific Policy Resolution adopted by Parliament in 1958. One part of the Resolution states, "The wealth and prosperity of a nation depend on the effective utilization of its human and material resources through industrialization. The use of human material for industrialization demands its education in science and training in technical skills. Industry opens up possibilities of greater fulfilment for the individual." We now know that had only the words "agricultural development" been added to this Resolution along with "industrialization", the hopes expressed could have at least partially become true. It is this lack of appreciation of the pivotal role of agricultural research in harnessing the advantageous features of our biological endowments that probably led to the indifference of the Government in improving the administration of agricultural research. This is clear when one compares the situation in the field of atomic energy, where numerous changes were made in the administration of science.

Reviews of the agricultural research work in progress in our country have been made periodically by various scientific teams. From time to time, certain improvements had been introduced into the working of the Indian Council of Agricultural Research on the basis of the suggestions made by such teams, which have all felt that ICAR should

become an effective instrument for coordinating research on agriculture, animal husbandry and fisheries in the country. These changes, however, had only a marginal effect in achieving an effective coordination of research and integration of work in the different scientific disciplines. The last Research Reviews Team led by the late Dr. Marion Parker of the U.S. Department of Agriculture in its report submitted in 1963, therefore, suggested more fundamental alternations in the structure and scope of activities of the Indian Council of Agricultural Research. This Team wanted to achieve two main purposes. First, the research work in progress under (*a*) what were then termed as the subordinate offices of the Department of Agriculture which included institutes like the Indian Agricultural Research Institute, the Indian Veterinary Research Institute and the National Dairy Research Institute, (*b*) PIRRCOM centre (Project for the Intensification of Regional Research in Cotton, Oilseeds and Millets) and certain other institutes directly managed by the Indian Council of Agricultural Research, (*c*) Commodity Institutes like those on jute, arecanut, coconut, tobacco, etc., managed by separate Commodity Committees, (*d*) Agricultural Universities, and (*e*) State Governments should all become part of an integrated set-up and should become instilled with a sense of common purpose. Secondly, the administrative and organizational structure of the ICAR should be modified in such a way that the administrative part of the machinery becomes subservient to the scientific and technical part. In other words, ICAR should become an effective scientific body so that it could provide the leadership necessary for stimulating the major research break-throughs essential for capitalizing on our natural biological assets like sunlight.

During the last four years, some of the steps needed to implement these important suggestions and bring into existence a "new" ICAR have been taken. The changes went through the following steps. Following the approval of the cabinet of the reorganization proposals, an eminent scientist was appointed as the Director-General of the ICAR, thereby replacing the tradition that such a post is to be occupied only by an administrator. Secondly, the various Commodity Committees were reconstituted as Development Councils and the control of the research institutes run by them was transferred to the ICAR. Thirdly, the PIRRCOM centres which could not be amalgamated with the State research institutions, were placed under the technical control of the Indian Agricultural Research Institute. Fourthly, the control of the centrally-run institutes was transferred to the Indian Council of Agricultural Research.

The problem of more active and effective relationship between

State, University and ICAR research institutions is proposed to be tackled through a series of All-India Coordinated Research Projects. These Projects were drawn up by groups of scientists endowed with expert knowledge in the crops or problems concerned. These All-India Coordinated Research Projects are being implemented during the Fourth Plan and they envisage the setting up of many regional stations in the different states. These stations will be under the administrative control of the States concerned but will be subject to an overall technical coordination. The day-to-day coordination work is discharged by whole-time Project Coordinators who are experienced scientists. The Coordinated Project is a unique instrument for achieving inter-institutional and inter-disciplinary integration in research work, without causing any "administrative disturbances". For ensuring the smooth functioning of these projects, a Memorandum of Understanding has been drawn up for being executed by the ICAR and the States concerned. This Memorandum would help to facilitate more close cooperation among the personnel employed in an All-India Research Project, irrespective of their location. Thus, the base for a really integrated and coordinated attack on agricultural problems and for conducting adaptive research has been laid.

With the transfer of the research institutes to the control of the ICAR which is a registered society, certain changes could be made in the rules and regulations prescribed for a Government Department. The most important of such changes was in the method of recruitment of research personnel. The ICAR could nominate its own Selection Committees comprising mostly of scientists so that a better technical assessment of candidates could be accomplished. Changes in financial and other procedures could not be made since the employees of the institutions are still mostly Government servants on notional deputation with the ICAR. However, a beginning has been made to develop a system of administration suited to the needs of agricultural science and one can only hope at this stage that the beginning will not also be the end and that the structural changes needed to get the best out of agricultural research will be brought about.

At the State level, the constitution of Agricultural Universities and entrusting them with the responsibility for research and education is a major step for removing the administrative constraints enfeebling research output. The establishment of effective Agricultural Universities is not also an easy task because of antagonism in some cases between the Departments of Agriculture and the Agricultural Universities. Any process of change will certainly be beset with new problems but if the goal is clear and dear to all, the difficulties can be overcome.

Finally, a great lacuna in the present system of administration of research is the inadequate integration between Government's social and economic objectives and research policies (with particular reference to the deployment of the available resources). For example, the Fourth Five Year Plan Document mentions, "In the agricultural sector, the Fourth Plan has two main objectives. The first objective is to provide the conditions necessary for a sustained increase of about 5 per cent per annum over the next decade. The second objective is to enable as large a section of the rural population as possible, including the small cultivator and the farmer in dry areas, to participate in development and share the benefits. Accordingly, the priority programmes of development in agriculture fall broadly into two categories, namely, those which aim at maximizing production and those which aim at remedying imbalances." What are the implications of these aims with reference to policy formulation in agricultural research? Is there any agency which assesses the magnitude, diversity and intensity of research needed to assure the attainment of the Plan Objectives? As far as I know, a sum of less than Rs. 10 crores will be available for research during the 5-year period for working on problems relating to "remedying imbalances". Is this quantum of scientific effort adequate to meet the stated aims? Recently, two panels of Scientists have been constituted by the Planning Commission to study problems of this kind. It is premature to assess how effective this Panel approach is going to be.

The slogan "agricultural development for food self-sufficiency" is probably the basic cause of ignoring science in relation to development. We should change this slogan into "agricultural development for economic advance". The problems of unemployment, underemployment and poverty can be solved rapidly only through the exploitation of our agricultural resources. The sooner, therefore, the Government discards its outmoded outlook towards the administration of agricultural research, the greater will be the prospect of India surviving as an economically and socially viable nation.

ORGANIZATION, MANAGEMENT AND PROGRESS OF ATOMIC ENERGY RESEARCH IN INDIA

Ved Prakash

DESPITE the discovery of the phenomenon of radio-activity towards the end of nineteenth century, it was not until 1939 that the possibility of releasing through fission large amount of energy for military or other purposes became known. The period since then has witnessed the introduction and exploitation of this energy, the atomic energy, which, "even as its destructive capacity casts a mushroom cloud of gloom over mankind, offers bright prospects for contributing to human well-being"[1].

Recognizing the importance and utility of the 'brighter' aspect of atomic energy, the Government of independent India enacted in the very first year of its inception the Atomic Energy Act, 1948. The Act drafted on the lines of the Atomic Energy Act of U.K. (1946), gave the Government of India *exclusive* powers to control and develop atomic energy and to carry out research in the connected fields. The control over plants designed or adopted for the production or the use of atomic energy and the working or the export of nuclear materials was also vested in the Central Government under the provisions of this Act. In view of various inadequacies experienced while administering the Act, it was replaced by the Atomic Energy Act of 1962. The new Act vests greater responsibility in the Department of Atomic Energy, particularly in safeguarding the health of workers in all establishments and institutions making use of radiation sources. One of the features of the Act is that its preamble provides for the development, control and use of atomic energy *only* for peaceful purposes.

Armed with the authority to control and develop atomic energy in the country on an exclusive basis, the Government of India has taken up an ambitious programme of research in and exploitation of atomic energy. The motive for nuclear development programme has been to achieve eventual self-sufficiency in all aspects of atomic technology and in the production of nuclear fuels.

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[1] Hodgetts, J. E., Administering the Atom for Peace, 1964, Atherton Press, New York.

But the main objective of the nuclear development programme, as indicated by policy statements and subsequent efforts of the Atomic Energy Department, has, thus, been power for energy—poor areas and additional power to supplement the existing power sources. This is in consonance with the national economic objectives—industrialization, balanced regional development, self-reliance in essential materials and equipment, etc. The high priority to this programme seems to be based on the consideration that "nuclear power provides a special means of leaping forward several decades in a few years".[2]

The fact that the nuclear power is generally costlier than the power produced from conventional sources was known to the Government before it took up the programme of nuclear power development. But it was also recognized that there were limitations in producing hydro-electric and thermal power in the country. In the case of former it was argued that "hydro-electric installations take many years to complete and the time factor in a power-starved area may justify thermal power stations even though the ultimate cost of electricity would be higher".[3]

The Government of India has desisted from undertaking a big programme of thermal power development on various considerations. Firstly, the estimated reserves of coal in the country[4] though sufficient for a few decades, are not considered adequate to supply an industrialized society. Secondly, the only economic mode of transportation of goods in India is railways. Nearly half of the carrying capacity of the railways is presently devoted to coal. But due to limitations of rolling stock and inadequate trackage, the railways are considered insufficiently equipped for hauling the growing quantities of goods, which require to be moved. Another consideration disfavouring a large expansion of the thermal power development has been to prevent "a sharp rise in fuel prices generally".[5]

The other possible motives of the Government of India in undertaking the atomic energy programme, though never professed, could be to achieve prestige among Afro-Asian countries and to attain competence to manufacture nuclear arms, as and when the need arises.

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[2] Gold, Norman L., "Regional Economic Development and Nuclear Power in India", 1957, National Planning Association, Washington.

[3] Bhabha, H. J., in the article "The Need for Atomic Energy in Under-developed Countries", included in the book "The Economics of Nuclear Power" Edited Maxwell, I. R., 1959, Pergamon, London.

[4] The estimated reserves of coal in India are about 43 billion tons as compared to 2.2 trillion tons in U.S.A.

[5] Goldring, Mary E., The Economics of Nuclear Energy, 1957, Bulterworth's Scientific Publications, London.

The Government of India had recognized the need to provide to scientific research institutions an organizational structure which enjoys autonomy from unnecessary rules and procedures. The CSIR and ICAR were thus organized as registered societies. But due to various other considerations including secretive nature of work, the atomic energy programme was taken up by the Government of India as a departmental undertaking. Special organizational pattern, rules and procedures have, however, been adopted to meet the special requirements of the programme.

Under the terms of the Atomic Energy Act of 1948, an Atomic Energy Commission was set up in August 1948, to survey the country for atomic minerals, to work and develop such minerals on an industrial scale, to do research in the scientific and technical problems connected with the release of atomic energy for peaceful purposes, to train and develop the necessary scientific and technical personnel for this work and to foster fundamental research in nuclear sciences.

The Atomic Energy Commission was constituted as an advisory and policy-making body and its decisions were executed through the Department of Scientific Research and later through the Ministry of National Resources and Scientific Research, of which it formed a part. In August 1954 the Government of India set up a separate Department of Atomic Energy charged solely with the development of atomic energy. The Department was placed under the direct charge of the Prime Minister and Dr. H. J. Bhabha, Chairman of the Atomic Energy Commission was appointed the first Secretary of the Department. The Department's headquarters were located in Bombay for administrative convenience and for maintaining close contacts with the main centre of its activity.

In view of the progress made in the field of harnessing atomic energy for peaceful purposes, it was felt that the terms of the existing Atomic Energy Commission, which functioned primarily in an advisory capacity, were no longer commensurate with the tasks ahead. In order to implement the greatly expanded programme for the development of atomic energy, designed to make the country self-sufficient in this field, it became imperative to have an organization with full authority to plan and implement such a programme on sound technical and economic principles. Among other things, such an organization had to be free from all non-essential restrictions and needlessly inelastic rules. Accordingly, in March 1958 the Atomic Energy Commission was reconstituted with full powers of the Government of India, both administrative and financial, within the limits of the budget provisions

allocated by the Parliament. The reconstituted Commission was modelled, more or less, on the lines of the Railway Board.

The orders for reconstitution of the Atomic Energy Commission provided that "(*a*) The Commission shall consist of both full-time and part-time members, the total number of whom shall not be less than three and not more than seven; (*b*) The Secretary to the Government of India in the Department of Atomic Energy shall be the *ex officio* Chairman of the Commission; (*c*) Another full-time member of the Commission shall be the Member for Finance and Administration, who shall also be *ex officio* Secretary to the Government of India in the Department of Atomic Energy in financial matters; and (*d*) The Director of the Atomic Energy Establishment, Trombay, shall be the third *ex officio* full-time member in charge of research and development".

The Member for Finance and Administration was to exercise the powers of the Government of India in all financial matters concerning the Department of Atomic Energy. No financial proposals could be sanctioned without his prior concurrence. The full-time Member for Finance and Administration was, thus, to be the chief official of the Department for finance and administration. "However, it was soon realized that with the given set-up and nomenclature there was confusion as to the responsibility and accountability of the Chairman-cum-Secretary and the Member for Finance and Administration."[6] Hence the constitution of the Atomic Energy Commission was again amended in 1962, to clarify the role of the Member of Finance and Administration. The revision provided that instead of having a full-time Member for Finance and Administration, one of the Members of the Commission was to be the Member of Finance and he was to exercise the powers of the Government of India in financial matters concerning the Department of Atomic Energy except insofar as such powers as had been or are in future conferred on or delegated to the Department. The Chairman could also authorize, as per the provisions of the amendment, any member of the Commission to exercise such powers and responsibilities as he may decide.

The Atomic Energy Commission, as reconstituted, is the authority to formulate the policy of the Department of Atomic Energy for approval of the Prime Minister, who is also the Minister incharge of the Department. The Commission is also responsible for preparing

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[6] Chowdhry, Kamla and Sarabhai, Vikram, "Organisation for Development Tasks: Atomic Energy Commission of India", Indian Journal of Public Administration, Vol. XIV, No. 1, Jan.-March, 1968.

the budget of the Department and for the implementation of Government's atomic energy policy. The Chairman of the Atomic Energy Commission in his capacity as Secretary to the Government of India in the Department of Atomic Energy, is responsible under the Prime Minister for arriving at decisions on technical questions and advising Government on matters of atomic policy. All recommendations of the Commission on policy and allied matters are put up to the Prime Minister through the Chairman, who has the power to override the other Member of the Commission.

The research activities in atomic energy field are carried out in the various constituent units of the Atomic Energy Department. These units, excluding those engaged on space research, are: Bhabha Atomic Research Centre, Trombay; Atomic Minerals Division, New Delhi; Tarapore Atomic Power Project; Rajasthan Atomic Power Project, Kota; Madras Atomic Power Project; and Power Project Engineering Division, Bombay.

The Bhabha Atomic Research Centre, Trombay[7], the main unit of the Department of Atomic Energy, is India's national centre for research and development in the field of atomic energy. It is today the largest scientific research institution in the country, employing about nine thousand persons, of which nearly sixty per cent are scientific and technical personnel. The scope of activities of the Centre mainly concerns the development of atomic energy for peaceful purposes and it includes basic research in nuclear science, development of nuclear technology, and use of atomic radiation. It also undertakes training of scientists and technologists to support the programme for the application of atomic energy for the future needs of the country. The Bhabha Atomic Research Centre works in seven groups, *viz*., those of Physics, Electronics, Radiation Projection, Engineering, Metallurgy, Bio-Medical and Administrative. Establishment of three reactors and their operation is one of the main achievements of the Centre.

The Atomic Minerals Division is another main constituent of the Department, responsible for carrying out surveys and undertaking prospecting, development and acquisition of atomic minerals, and connected research work. The task of prospecting of atomic mineral is also undertaken by two public undertakings, *viz*., the Indian Rare Earths Limited and the Uranium Corporation of India Limited, which are under the administrative control of the Department of Atomic Energy.

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[7] Formerly known as the Atomic Energy Establishment.

The three atomic power units erected by the Department of Atomic Energy are located at Tarapore (Maharashtra—near Bombay), Kota (Rajasthan) and Madras. The Power Project Engineering Division undertakes the construction works of the power stations. It also carries out development activities necessary for effecting improvement in the design and construction of the power stations.

The Department of Atomic Energy, as would be clear from the preceding paragraphs, has been provided with special organizational structure commensurate with the task it has taken up. The Atomic Energy Commission enjoys full executive and financial powers of the Government and its constitution has been amended to provide it with enhanced powers, as and when considered necessary. Similarly, the Department has followed a number of management and administrative practices which are conducive for the conduct of activities assigned to it. Some of these practices are described below.

Personnel Management

One of the main criticisms levied against undertaking scientific research as a departmental undertakings is that it does not permit flexibility in the recruitment, promotion and other administrative procedures, which is so necessary for the smooth conduct of research. But Atomic Energy Department has been fortunate to the extent that it enjoys a number of privileges not permitted to any other Department. The posts under the Department are exempted from being filled through selection made by UPSC. The Department has, thus, set its own norms and formulated its own procedures for recruitment of staff.

There are two salient points in the recruitment procedures followed by the Department of Atomic Energy. Firstly, the rules provide for direct recruitment of highly qualified persons. In such cases the application of the candidate is considered, along with the confidential report of two referees, by the Head of the Division concerned with the branch of the specialization of the candidate. If found suitable, the case is referred to the Group Board, on whose approval the candidate is interviewed and absorbed in appropriate grade, commensurate with his qualifications and talents. If need be, the candidate is also interviewed outside India, and if selected, issued with an offer of appointment. This flexibility in recruitment procedures has enabled the Atomic Energy Commission to attract highly qualified persons and has permitted the building up of the atomic energy research programme around outstanding persons.

The other novel experiment in recruitment follows the principle—'catch them young'. Under this scheme the Training School[8] of the Bhabha Atomic Research Centre admits every year after a very rigorous selection and personal interview, about 200 young science, engineering and metallurgy graduates and post-graduates. The selected candidates are given specialized training at the school to fit them for work in one of the fields of research. In order to attract the best type of candidate, each trainee is given a stipend and book allowance. On completion of their training, the trainees are examined and absorbed in various grades according to merit. This method of building up staff has helped in not draining away senior persons from the universities and on the contrary has given training, employment and opportunities to young graduates passing out of the universities.

Salaries of scientists and engineers working in the Atomic Energy Department are based on "merit and maturity, rather than in terms of organizational position and status. Promotion did not imply handing over charge of one task and going another. Positions are created whenever competent persons are available for identified tasks".[9] The evaluation procedures provide, at the first instant, for the writing of his own report by a research worker, describing his performance in relation to the assigned task and also mentioning any special accomplishments or problems. This report is then processed independently by two assessors. The report with the recommendations of the assessors is sent to the Director for necessary action.

Financial Management

The Atomic Energy Commission, as at present constituted, enjoys full financial powers of the Government of India, within the limits of the budget provisions allotted by Parliament. The Member for Finance of the Commission also acts as *ex officio* Secretary to the Government of India in the Department of Atomic Energy in financial matters.

A comprehensive system of delegation of financial powers at various levels of authority is followed in the Atomic Energy Department. Taking the case of Bhabha Atomic Research Centre as an example, the Director of the Centre has been declared Head of Department for the purposes of Fundamental Rules, Supplementary Rules, Civil Service Regulations, General Financial Rules, General Provident Fund (Central Services) Rules, Contributory Provident Fund (India) Rules and the Treasury Rules. The Director has delegated part of his

[8] The school was started in 1957.

[9] Chowdhry, Kamla and Sarabhai, Vikram, *op. cit.*

powers under these Rules to authorities subordinate to him. Further, the Assistant Controller (Accounts) in the Bhabha Atomic Research Centre also acts as Internal Financial Adviser and Internal Auditor of the Centre. In his capacity as Internal Financial Adviser, the Assistant Controller (Accounts) advises the Director of the Centre regarding the availability of funds and whether the conditions laid down for the exercise of powers delegated to him are fulfilled. The Director has the right to reject the advice of the Internal Financial Adviser but the Director is required to send to the Atomic Energy Commission a report on each case in which the advice of the Internal Financial Adviser has been rejected by him. Similarly, the Officer, to whom powers have been delegated by Director of the Centre, also seeks the advice of the Internal Financial Adviser and in case of disagreement, the matter is put up to the Director for orders.

Administrative Rules and Procedures

In the matter of conduct rules, etc., for the staff and the financial rules, the Atomic Energy Department is governed by the same set of rules as are applicable to other Government servants and offices. In the selection of staff, as explained earlier, the Atomic Energy Department is placed outside the purview of the Union Public Service Commission. In the implementation of the service and financial rules the Atomic Energy Department has evolved various norms and procedures which help in avoiding irritants like delays, inefficiency, favouritism, etc. It has adopted a comprehensive system of delegation of powers to officers at various levels, which has promoted efficiency and a sense of involvement. The delegation of power orders have been amended as and when these are found to be inadequate to conduct work efficiently. The powers delegated to appropriate levels include those for creation of posts, works, repairs and maintenance, printing and stationery, purchase of stores and equipment, etc.

Powers beyond a limit are delegated to committees than individuals. For example, it is customary in the Bhabha Atomic Research Centre to require its various Divisions to process proposals for purchases of costly items of equipment and stores through the group boards as well as the Stores and Equipment Committee. The Stores and Equipment Committee consisting of Controller, Internal Financial Adviser, representative of Purchase and Stores Division and other specialist members, meets every fortnight, to consider proposals from various Divisions for purchases of equipment and stores costing more than Rs. 5,000 and Rs. 20,000 respectively. Proposals for purchases exceeding Rs. 50,000 are sent by Stores and Equipment Committee

to Trombay Council for further approval. This Committee also scrutinises at the time of considering any item of equipment for purchases whether similar equipment already exist in other Divisions and if so whether the same could be made use of instead of making an additional purchase. Occasionally the Stores and Equipment Committee makes recommendations to the Trombay Scientific Committee for the purpose of laying down broad policy lines for avoidance of duplicating facilities. Recent instance may be mentioned when the Trombay Scientific Committee on recommendation of Stores and Equipment Committee asked a small sub-committee to go into the problems of separate workshop requirements for various Divisions.

Progress

The country ventured into undertaking scientific research in the field of atomic energy about two decades ago. The first task of the Atomic Energy Commission was to build up nuclei of scientists in the different fields of sciences related to atomic energy. With the basic approach to build organization around men and not to weaken the base at the University level, it took the Commission about 5 years to create an organizational structure sufficiently developed to take up an advanced programme of nuclear research. It is often pointed out that the Atomic Energy Commission has virtually to start from scratch as it did not have the benefit of a nucleus of scientists who had participated in the development of atomic energy during the war years. But the same is equally true about most of the other scientific research organizations in India. For example, the CSIR laboratories were manned in its initial stages by scientists who had a little or practically no experience of industrial research. The Atomic Energy Commission had at least the advantage of personnel and facilities of the Tata Institute of Fundamental Research, which was headed at that time by Dr. Bhabha, Chairman of the Atomic Energy Commission.

Turning point in the expansion of the atomic energy research programme was reached in 1954, and the efforts since then have enabled the country to reach sufficiently high level of competence in nuclear technology and in the production of nuclear fuels. The Atomic Minerals Division of the Department has some important achievements to its credit, including the discovery of large uranium deposits in the Jaduguda area of Bihar State, extensive thorium rich minerals on the Ranchi Plateau in Bihar State and valuable beryl and lithium ores at other places. Two public undertakings under the administrative control of the Department are assisting in the commercial exploitation of nuclear minerals.

The Bhaba Atomic Research Centre of the Department has achieved high proficiency in nuclear technology. Its accomplishments include the setting up and operation of the three atomic reactors. The task of building up the first reactor 'Apsara' was taken up in 1955. Taking advantage of the offer of the U.K. Atomic Energy Authority to make available enriched uranium in the form of fabricated fuel elements, it was decided to build this reactor of pool type (which required enriched uranium fuel elements). Though basically similar reactors were available on sale, it was considered that valuable experience would be gained if Indian scientists and engineers were made entirely responsible for the design, erection and commissioning of India's first reactor. The reactor became critical on August 4, 1956 and since then is being operated as per schedule, providing facilities for research and producing isotopes. The total power output of the reactor, since it became critical, exceeds 16 million KWH with a total operating time of about 50,000 hours.

The second reactor 'Cirus', a high flux type 40 MW research and isotope-producing reactor was set up in 1956, with the assistance of the Canadian Government. Indian scientists and engineers were associated with all the intricate job of building the reactor, in which some of the indigenously fabricated items were also used. The reactor went critical on July 10, 1960 and is being operated since then, at an operating efficiency of 80 per cent.

India's third reactor, 'Zerlina', a very low-power reactor, was designed, engineered and built entirely by Indian personnel. The fabrication of this small research reactor was started in February 1958 and it became critical on January 14, 1961.

The other main achievement of the atomic energy research in India has been the installation of atomic power stations. The first station has been located at Tarapore, a place 60 miles of Bombay, and it will supply 380 MW power to the industrial regions of Maharashtra and Gujarat States, where there is inadequacy of conventional power. It was decided to invite global tenders for building the complete atomic power station though the task could have as well been done by Indian scientists and engineers. This was done to avail the advantage of progress achieved elsewhere and to save time. The work on the Project is almost complete.

The second atomic power station is being installed at Rana Pratap Sagar near Kota in Rajasthan with Canadian assistance. This Project comprises two units, each of 200 MW and is being built by Indian

scientists and engineers working with Canadian designs. The third atomic power station is being installed at Kapakkam in Tamil Nadu State and considerable progress has been made in the planning of the Project. This 200 MW station is being built entirely by Indian scientists and engineers.

A number of factors have contributed to the achievement of the progress in the field of atomic energy research. Of these, the organizational structure and the authority provided to the Atomic Energy Commission has been the most important. The constitution of the Commission has been amended, whenever it was found necessary to vest it with more powers. In addition, the Commission had the privilege of having, for the best part of its life of 20 years, as its chief executive the person, who received a great deal of support and understanding from the Prime Minister of India. With support of this magnitude, it was not difficult for the Commission to attain administrative powers (like exemption from the purview of UPSC in the recruitment of staff) and financial resources,[10] as are not easily made available to other Departments of the Government.

Another important factor has been the combination of policy-making, executive and scientific roles in the chief executive, which provided him with necessary power, freedom and authority. The adoption of appropriate administrative procedures, those of selection, promotion, evaluation, budgetary controls, buying of supplies and equipment, have contributed in the progress of the programme in no mean way.

The higher cost of the atomic power as compared to power generated from conventional sources, is one of the points of criticism against undertaking the expensive programme of atomic energy research. It is also argued that the pace of India's industrialization does not justify such a large investment as has been made. But these are some of the policy issues which were fully looked into before embarking upon an ambitious programme of atomic energy and hence have no validity as points of criticism against the Atomic Energy Commission. Another contention against the Commission is that it has generally been overly optimistic about the operational dates and costs of their projects. But this situation is likely to be corrected as experience is gained. Thus, the progress of atomic energy research in India has been quite impressive. But the real test of progress, would be the competence to produce nuclear weapons, in case the country decides to go in for these, if at all, at a future date.

[10] The budget estimate of the Atomic Energy Department for the year 1969-70 is about Rs. 22 crores almost equal to the figures of CSIR and its 30 laboratories.

RECRUITMENT AND TRAINING OF SCIENTIFIC PERSONNEL

A. R. Kidwai

THE importance of science and technology and in developing the natural resources and building economic infra-structure of the country was recognized in India, to an extent, long ago. The Department of Meteorology was established in 1796, the Zoological Survey of India, in 1816, the Geological Survey in 1851 and the Botanical Survey in 1889. There was also developed a vast network of roads, railways and canals. The establishment of industries during the first world war and their growth during the second brought in their awake the problem of utilizing scientific knowledge to promote industrial development. After the attainment of Independence, and with the adoption of planning as the chief instrument of achieving socio-economic development, there has been a phenomenal increase in the scope and scale of the responsibilities of the Government in the spheres of development and welfare. As a result of the far-sighted and dynamic leadership of the late Prime Minister, Jawaharlal Nehru, education and research in science has come to receive special attention at the hands of the Government. There has been an enormous expansion in educational facilities and trained manpower in scientific and technical fields. A vast network of scientific research organizations has come up during the last two decades. The major portion of the scientific research effort sponsored by the Government is organized under autonomous and semi-autonomous bodies like CSIR, ICAR, ICMR, and atomic energy establishment. The defence research and development organization is managed by the Government Directly. Scientific research is also conducted on departmental basis as well as in co-operative research organizations of industries like textiles, silk, plywood, tea and cement.

The increased involvement of the Government in developmental activities makes inevitable the use of scientific and technological researches. Government has today to deal with a vast multitude of problems involving use of science and technology, such as, production of fertilizers, insecticides, petro-chemicals, etc.; development of hydro-electric, thermal and nuclear energy, telecommunications and air transport; manufacture of sophisticated defence equipment; construc-

control of diseases and the like. For accelerating the pace of economic growth and improvement of living standards of the people, Government has to mobilise its scientific and technical manpower in the most efficient manner through suitable programmes of recruitment, training and career advancement.

Recuitment Policy

There appears to be no uniform policy for recruitment of scientific and technical personnel to various scientific organizations. The Union Public Service Commission is responsible for recruitment to all posts under the Central Government except for certain categories of posts and organizations specially exempted from its purview. For this purpose the UPSC has elaborate and well established procedures. However, semi-government scientific organizations like the Council of Scientific and Industrial Research, Indian Council of Medical Research and Indian Council of Agricultural Research have their own selection committees and rules of recruitment which, in some respect, are similar to those of the UPSC. The Atomic Energy Commission, too, has its own recruitment rules and procedure but these are much different from those of other scientific organizations.

It is generally conceded that qualities required of scientific personnel are quite different from those needed for administrative services. The latter have to, for the most part, function within a set framework of policies, precedents, rules and regulations providing continuity and stability to the administrative process. Their functioning is impersonalised to the extent that if one person is substituted by another, everyone knows how the successor will behave and operate under a given set of circumstances. On the other hand, people working in scientific and research organizations have to work or creative insights and hunches. They have to act as non-conformists, questioning assumptions, exploring new inter-relationship and innovating. It is, therefore, felt that different criteria and procedure need to be used for appointments to scientific and technical posts.

This has been very well elaborated by a study team of the Administrative Reforms Commission dealing with scientific departments. However, some basic considerations may be outlined here for the purpose of recruitment of scientists.

(1) The various disciplines in science and technology have become exceedingly specialized and, therefore, only specialists in the subject can judge merits of the scientific and technical personnel.

(2) Merit cannot be judged by merely specifying academic qualifications and the number of years that a man may have spent in work of a specified type or on research. A scientist and a technologist has to be judged by the quality and the originality of his research contribution rather than on the basis of the number of papers published. This calls for close examination and evaluation of the scientific contribution of the individual.

(3) Even for the recruitment of fresh science graduates a searching enquiry needs to be made into the knowledge and research potentials of the candidate by a competent scientist, for the university degree by itself provides no satisfactory indication in this regard. This may, perhaps, be done through objective tests, by posing of new problems and situations for the candidate, interviews and seminar discussions.

(4) The pay-scale of a scientist should be determined primarily by his ability and distinction as a scientist. The promotion of a scientist on the basis of his scientific qualities and attitudes should be possible without involving a change in the nature of his work.

The pay-scales in various scientific organizations are not uniform and they are also generally lower than those for administrative and other services. Scientists of proven calibre are a scarce commodity in the country and if they have to function efficiently, there is no reason why the salaries offered to them should in any way be lower than those offered to other services in the country.

In July 1965, a Cabinet directive was issued fixing the scales of pay for directors of the national laboratories and other similar institutions. However, these recommendations have not been adopted in some of the institutions, particularly in the case of scientists working in educational institutions.

(5) A pyramidal system based on the tapering of avenues for promotion as one goes higher up in pay-scale may be satisfactory for administrative service where interchangeability of staff horizontally is relatively easy. In science and technology, which is characterized by a high degree of specialization in different areas, such horizontal interchangeability between different specialized areas is not feasible. It is clear, therefore, that appropriate avenues for career advancement will have to be provided in each of the specialized areas up to a reasonably high level.

(6) For higher scientific and technological appointments, age should not be the consideration, since the most creative and productive period of scientists and technologists has been found to be much below 40 years.

(7) The mobility of scientists between universities, automomous scientific organizations and departmentally managed scientific institutions and also from department to department within the same organization can be most useful for better utilization of the training and talents of the scientists. They should be given full freedom to adjust themselves in a position where they can contribute most. In order to achieve this, deputations and transfers from one service to another should be allowed if desired by the scientists. Restrictions on applying for jobs should be removed. Scientists should be allowed to carry with them service, pension and other benefits from one service to another.

(8) Procedures regarding appointment of scientists and technologists should be relatively flexible so that outstanding scientist, who may not have applied for a particular post but may be suitable for it, could be offered appointment without being interviewed. The procedures should also be flexible enough to consider applications of qualified scientists even if there are certain procedural defects in their applications which could be rectified wherever necessary.

(9) Quite often scientists and technologists of standing do not like to enter Government services on a long term basis but will have no objection to enter it for a short time on a contract for 3 to 5 years, with an option of renewal at the end of the period. Provisions exist for such appointments but they are made sparingly. Such appointments would be in the interest of the scientists who could thus remain in touch with their professions. These scientists will also bring new ideas and talents into the scientific institutions run or sponsored by the Government.

(10) The hierarchical structure in government service has unfortunately found its way into scientific research institutions also. Such a structure may have relevance to certain administrative needs. It is certainly not conducive to producing the right relationship and interaction among scientists so necessary for creative thinking and innovation. On scientific matters all scientists should be able to communicate with each other at a level of equality. In their mutual relations, regard,

respect or status should be a product of scientific achievements rather than of seniority in the service. Academic freedom implies respect for opinions and ideas, irrespective of the status of the individual who expresses them. A junior scientist working on a project should have sufficient freedom to act independently on his assignment, so that he is able to identify himself completely with the work he is handling. He should be made to feel that he has an important place in the organization. In many cases today, the individual scientist feels that he is there to work for others.

Perhaps, it is with this philosophy that the Council of Scientific and Industrial Research and the Atomic Energy Commission have given up designations denoting hierarchical differences and have adopted the uniform designation of scientist. This practice may perhaps be adopted by other scientific organizations also.

Broadly speaking, there are several shades of opinion about the role of the UPSC in recruitment of scientific and technical personnel. According to one school of thought, recruitment of scientific and technical personnel employed in institutions under autonomous bodies like CSIR, ICAR, etc., and the Atomic Energy Establishment should also be brought within the purview of the Commission. Some others, however, feel quite the opposite. According to them, recruitment of scientific and technical personnel for the departmentally managed scientific institutions should be handled not by the UPSC but by the controlling departments of these institutions. It would be worthwhile, here, to mention the approach adopted by the Administrative Reforms Commission on this important issue. The Commission has, in its report on Personnel Administration, recommended as follows:

(*i*) The UPSC should be associated with the selection of personnel to, and their promotion within, the quasi-government bodies entirely or substantially financed by Government.

(*ii*) In the case of smaller organizations, the function of the UPSC should be to approve the regulations governing recruitment and promotion, including the constitution of selection boards and promotion committees.

(*iii*) In the case of bigger organizations like the CSIR, however, only broad personnel policies need be framed in consultation

with the UPSC, the details of selection and promotion being left to the organization itself.

(*iv*) In all cases, the UPSC should develop an adequate system of reporting and inspection to ensure that at least minimum standards are observed in selection and promotion. The Commission may recommend, at their discretion, the annulment of selections and promotions falling short of such minimum standards.

(*v*) Comments, if any, by the UPSC on the working of these organizations should be incorporated in its annual report to be placed before Parliament.

(*vi*) Powers similar to those proposed for the UPSC, should vest in the State PSCs *vis-a-vis* quasi-government institutions which are either entirely or substantially financed by the State Governments.

Presumably, the main consideration before the Administrative Reforms Commission in making the above recommendations was that there is no valid explanation for different procedures being followed for recruitment of scientific personnel in the scientific departments/ organizations. A recruitment procedure is the mean to the objective of selecting the best available talent. In ARC's view, a condition precedent to success of a good selection system is that the body responsible for recruitment should have an independent character and should be able to function as such.

In this connection, it would be of interest to note that the Fulton Committee on the British Civil Service (1966-69) has taken the view that recruitment, training and career advancement should constitute a single, closely integrated process and should be with the same authority. The Committee, therefore, proposed that the British Civil Service Commission should cease to be a separate and independent organization and should become a part of the new Civil Service Department. The Committee also felt that recruitment should be directly related to the needs of the user ministries/departments and, therefore, department should play a larger role in the recruitment process in two ways: (*i*) The department should be allowed to draw up the requirements of personnel at various levels and determine the patterns of recruitment according to the needs of the job; (*ii*) The departments should have greater influence on the selection of individuals. The Committee did consider the case for handling of recruitment over to the departments themselves; but rejected it on the grounds that it would encourage

wasteful competition; place the less glamorous departments at too great a disadvantage and break up a service which should remain unified. The Fulton Committee has, however, recommended that a higher proportion than at present should be recruited by the departments, and that employing departments should be better represented in the recruitment process. The Committee has further suggested that for certain specialized posts recruitment may conveniently be done by departments, acting together in groups, or by the new Civil Service Department on their behalf.

Promotion Policy

As the Fulton Committee has observed, "The right promotion at the right time is an essential part of the process of developing to the full talents of the men and women in the service." Among scientists in India today there is a general feeling that the career advancement is slower for scientific and technical personnel than for administrative services. It takes a long time for a new entrant to reach the top. Promotion opportunities being narrow at the top, most of the scientific personnel stop half way or three quarters way up in their service careers. The administrative services have better prospects for career advancement. The main reason for this is that most of the scientific and technical posts in Government are isolated, and promotion involves a fresh recruitment every time.

There is no doubt that the avenues for promotion in scientific departments are at present very inadequate. Generally, a scientist is recruited to a Class II or junior Class I post. His promotion at subsequent stages depends on the availability of senior posts in the particular field. Very often a scientist working in the same organization but in another field gets promotion much quicker just because a post is available for promotion in that field. This causes discontentment among scientists of similar qualifications, professional ability and intellectual calibre. The problem is aggravated by the fact that interchangeability of personnel as between different specialities is not generally feasible. And, therefore, in the field of science and technology a different system of promotion needs to be evolved in order to attract men of calibre and to retain those in service. It is understood that the ARC Study Team on Scientific Departments has suggested that promotions should be automatic up to a certain stage, and should be given within a certain range of time, the outstanding men moving up in the shortest time. The Study Team is reported to have also proposed that the scheme of promotion should provide for the elevation of scientist, on the basis his scientific attainment, to a higher grade without necessarily involving a change in the nature of his job. For example, a

scientist who does not want a promotion to a post involving administrative duties, which may be the next promotion available to him, should be able to get the higher grade without being shifted from the research work he is engaged on. The promotion procedure and policy of the Department of Atomic Energy are patterned on these lines.

In 1958, the Government of India drew up a two-fold scheme of incentives to provide for recognition and reward of highly meritorious work of scientific personnel by grant of merit promotions and advance increments. This scheme was made applicable to most of the Government and quasi-government scientific organizations but not to the universities. The important features of the scheme are as follows:

(*a*) *Merit promotion:* Scientists and technologists of outstanding merit should be promoted to the next higher grade on the basis of an assessment of the work by a properly constituted selection committee. However, merit promotions should be restricted to 5 per cent of the number of posts in a grade and to 25 per cent of the total number of research posts in the institution.

(*b*) *Advance increments:* Advance increments should be available to those persons who, in view of their outstanding work, are considered for merit promotion but are not so promoted, their performance being all the same of sufficient merit to deserve one or more advance increments.

As said earlier, the scheme has not been uniformally applied in all institutions. Even where the scheme was implemented, it did not yield the desired results to the full extent, because of the limitations imposed and certain inherent inadequacies. The scheme, however, has great potentiality if it is revised suitably and applied uniformally in all scientific and technical organizations.

The Administrative Reforms Commission has, in its report on Personnel Administration, suggested some substantial modification of the existing system of annual confidential reports of employee's performance. It has recommended that the officer concerned should be given an opportunity to give an account of his work and achievements during the year. The reporting officer will comment on the correctness or otherwise of this account and give his own independent assessment. The report will then go to a reviewing officer who will add his own comments. The Commission has also proposed that the annual report may be called 'Performance Report' in place of 'Confidential Report'. It may be of interest to note that the Fulton Committee has favoured a change of emphasis in the assessment of the civil servants

so as to give more weight to performance on the job measured against set objectives. There is, however, an important lacuna in the recommendations of the ARC report on the subject. The Commission is of the view that any adverse comments need not be communicated to the officer concerned. It is understood that the Study Team on Scientific Departments is not inclined to agree to the latter proposal and feels that the adverse remarks as well as favourable remarks should be communicated to the officer concerned, in order to protect him from any *mala fide* motives and also to provide opportunity to the officer to improve or rectify the defects.

Scientific Civil Service

It has been suggested in some quarters that the constitution of all-India scientific civil service on the lines of the IAS or IES would go a long way to help improve the morale of the scientists and would accord stability and status to scientific personnel. Some others, however, are doubtful of the utility of such a service. The multiplicity of specialities in the field of science does not admit of the constitution of a homogeneous service. Even within a broad speciality, there are bound to be several sub-specialities and interchangeability of personnel even between the latter may not always be an easy proposition. Again, if an all-India service is created, promotion will have to be made, for the large part, on the basis of seniority. Such a promotion system is ill-suited for development of creativity in the scientific personnel. Against this, it can be contended that it should not be impossible to modify the concept of a service or a cadre to accommodate the special requirement of scientific research.

Training

Even though there is a substantial base of those who have university degrees, there is shortage of competent scientists, technologists and administrators in our country. Therefore, the first step needed for building research and development organizations is to have properly qualified and trained personnel. It deserves to be mentioned that Dr. Homi Bhabha attached great importance to training of personnel at the time of the establishment of the Tata Institute of Fundamental Research, and also, later, in setting up the organization of the Atomic Energy Commission. In his scheme, he provided for the selection and training of 150 to 200 young scientists. These were selected by about 10 to 12 selection committees, each consisting of 4 to 5 scientists. The committees screened and interviewed 1,000 to 1,500 candidates during the course of 7 to 10 days. The selection process involved not only the evaluation of the academic qualifications

of each candidate but also a serious enquiry into his future capability as a researcher. This illustrates the need for and the magnitude of the effort necessary for ensuring proper selection of scientific personnel. The candidates selected through the above vigorous selection process followed by the Atomic Energy Commission have to undergo a comprehensive programme of training. But only a small percentage of students who secure top position during the course of training and evaluation are selected for employment in the various departments of the Atomic Energy Commission. No such scheme has, however, been evolved by any of the other government and non-government scientific organizations. However, there are junior and senior research fellowships in the universities, CSIR, ICAR and ICMR and Defence Research and Development Organization which are made available to talented young scientists for their doing research work in these organizations. Some of the research fellows get ultimately absorbed in the organizations. However, this cannot be considered to be a proper training programme.

It is well-known that the courses of studies offered by different universities and standards of teaching and examination are not uniform and, therefore, knowledge and background of candidates available for scientific posts vary greatly. Developments in science and its techniques are taking place at such a rapid pace that it is not possible for a number of educational institutions in the country to produce graduates with up-to-date knowledge. In such a situation, deficiencies in the education of students need to be made up through a rigorous training programme. It is therefore necessary for all research and development organizations to have a basic training programme for the new entrants so that they could develop and train the second generation of scientists. Again, scientific education in universities at the degree and M.Sc. levels is only general and provides basic knowledge of the subject. Thus, fresh graduates coming out of educational institutions cannot be expected to take up specialized jobs immediately. Therefore, specialized training has to be provided to them by the employing institutions themselves.

Science is a developing subject where revolutionary changes are taking place at a very quick pace. For example, in chemistry the rate of publication of research work is almost doubled in volume every 7½ years. Accordingly, education and training of scientists has become a continuous process. No scientist who loses touch with his subject can justifiably claim the stations of a creative scientist. Also, no scientist can be expected to do original research unless he is well aware of the latest developments in his field. In view of these considerations, it is suggested that all scientific organizations should arrange,

on regular basis, a programme of lectures, seminars and discussions on new developments. The scientist should also be provided opportunities to attend refresher courses, training programmes, symposia and seminars which may be organized by educational institutions and other organizations in the country and outside. For this purpose scientists should be treated as on duty and given the needed financial support. Scientists may also be allowed study leave for a period of three years during their service with half pay, and one year sabbatical leave every 6 years on full pay. Scientists can serve the cause of research and development only if they can keep themselves up-to-date with the developments in their fields.

Scientists should be encouraged to associate themselves with learned societies and professional bodies in their fields of interest. In other countries, learned bodies and professional societies play a major role in keeping scientists informed of the new developments and thus help in promoting their career advancement. Unfortunately, in India, learned societies and professional bodies have not yet played the role expected of them. However, increased interest of scientists in such bodies would automatically help promote the growth of professional organizations. Scientists should also be encouraged to subscribe to scientific journals and purchase books dealing with new developments in their fields.

Probationers of the IAS, IPS, IFS, and central non-technical Class I services at present undergo a foundational course at the National Academy of Administration. Although it may not be absolutely necessary but it would be of some advantage if the scientists undergo a similar but shorter course dealing with important aspects of Indian Constitution, concepts of planning and development and recent political and social developments for purposes of making them fully conscious of their responsibilities and obligations to the government and the public. Senior scientists who have to handle administrative problems would benefit very much if they could attend management courses at various levels. However, this should not be considered necessary for those who are involved in purely research work.

THE BRAIN DRAIN—SOME QUESTIONS

K. N. Butani

THE migration of high level scientific, technical and professional manpower across national boundaries, pejoratively called the "brain-drain", has become a much debated issue. It has been the subject of many studies by economists, social scientists and manpower analysts. It has aroused concern amongst Governments as much of the countries which "lose" as of those who "gain" by this migration and it has received attention at international level. This migration is witnessed as much from the developed countries of Western Europe to the U.S.A. as from the developing countries to the developed countries of the world, more particularly, the U.S.A., U.K. and Canada.

We would like to confine this brief article to the migration of high level manpower from India and much of our discussions will necessarily be focused on the relevance of this debate in the current situation in the country. Even in this limited context, this article only attempts to raise some pertinent questions.

Why do the Daedali of India migrate? Why are the Minoses of India becoming concerned about the propensity of these Daedali to take off across the border? And how many of those who migrate are potential Daedali. These are some questions to which we have to seek meaningful answers, before we can consider what may be done about it. Most of the studies on the brain-drain problem end up with lamenting the inadequacy of information, quantitative as well as qualitative, about this migration. We, in the Institute of Applied Manpower Research (IAMR), have launched a survey, at the instance of the Government of India, to ascertain the quantitative dimensions of the problem. The first phase of data gathering has been concluded. This has shown that from 1960 to 1967, the total number of non-official passports issued was about half a million, of which the so-called 'brain-drain' categories, *viz.*, engineers, doctors, science post-graduates, etc., accounted for about forty-five thousand; the number of such passport holders has increased from 3,600 in 1960 to 8,800 in 1967. We are now launching the second phase of the study to determine how many of these passport holders actually went abroad, how long they stayed, what they did there, how many have come back, what they are doing since their return, and a host of other related questions.

But suppose we have all the information relevant to the quisition of insights into this phenomenon, what shall we do? ıall we adopt what the Jones Committee in Britain called the 'Berlin all Approach' of total prohibition of outward movement? Nothing ort of this ruthless measure will really achieve any noticeable pact. And what, even if this approach were feasible in the context our constitutional and political framework, will we do to those ıom we so incarcerate within the national boundary?

Before we consider this, let us ponder over the problem without ejudice or passion and consider its relevance to the current situation our country. Firstly, let us remember that scholars have always ındered around the world in search of better facilities, more congenial vironments or better teachers. It is the magnitude of this migration, ulting from an explosion in the growth of science and technology the developed countries of the world, more specially the U.S.A., that causing concern bordering sometimes on near-panic. It has been imated for example that by 1970, the U.S.A. will need at least 200,000 re scientists and engineers than it can produce and that it is trying get them from wherever it can. Some estimate that the figure may ll be around half a million. A very alarming picture can be conjured from the rates of growth of GNP's of the rich countries and the reasing amounts of this GNP devoted to promoting advances in ence and technology.

Some, taking the factor mobility approach argue that the pheno- non of international migration of scientists reflects the operation of ernational market for a particular factor of production—specialized man capital. Such capital will tend to move where its productivity higher: the migrant will benefit, the receiving country will benefit, losing country may not necessarily be worse off. Others, adopting cost-benefit approach and taking into account the favourable l unfavourable aspects, argue that the static assumptions underlying doctrine of marginal productivity seem quite inadequate for the dy of this complex phenomena. Others, taking the manpower roach, point out that migration from developing countries to the anced countries—primarily the United States—draws from the eloping countries the manpower urgently required by them economic and social development. It has also pointed out that ile this aspect of the migration-question is simple, dramatic and ily comprehensible, it is also inapplicable to many developing ıntries. Some others, bringing in the concept of simultaneous ration of the Exchange and Grant economies in the world, ue that the traditional trade theory with its generally correct emphasis

on the advantages that result from the free movement of factors from low to high productivity areas, would need to be modified in terms of mid-twentieth century conception of the world economic interests.

May we, in India, look at this problem of migration from two angles: one relating to what may be called the "top notchers" in science, and the other to the technical and professional personnel needed for the production of goods and services? The award of the Nobel Prize to Hargovind Khurana focused attention dramatically on the former category. But can we look upon the migration of top notchers from the narrower concept of national boundaries? Is not Science worldwide? Can creative efforts of these top notchers be bound within territorial limits? Is not creativity in Science today a function of team work, capital intensity and much more importantly, environmental factors, depending upon the state of social and cultural development of a particular country? And, are the benefits of creativity in Science not universal? It may indeed be a great loss to inhibit the creativity of potential top notchers by imposing artificial barriers against their movement.

The question of scientific, technical and professional personnel "needed" as essential inputs for the economic and social development process, is a little more difficult. Development is a complex integrated process depending as much as the accumulation of other complementary factors such as capital etc., as on the interaction with the social and cultural factors. But here again, what is the current situation in India? Are our development programmes suffering on account of numerical shortages of such personnel? Can we really say that at the existing or foreseeable level of industrialization, we can absorb all the engineers and technicians whom we produce? A strong argument against the so-called brain-drain of this category usually centres around the demands of society for a return on the "investment" made by it in the education of these technical and professional personnel. Without going into the complex "economics" of this matter, can it not be equally legitimately argued that in the ultimate, society's goals are centered around the betterment of individual productivity and therefore it has a duty to its individual members to make investments in them of a character which will enable them to improve their productivity? Thus conceived, it might be argued that instead of feeling concerned about the migration of technical and professional personnel, we might even welcome proposals for their employment abroad. This may see an over-simplified version of complex situation regarding cost-and-benefits of investments in education in a developing society, but then the implication of imposing barriers against

international migration in a democratic and free society are equally complex.

The question of doctors, however, does leave a lurking question-mark in the mind. Doctors are "needed" in the country according to some socially desirable normative criteria. If the estimate of current outflow is assumed to prevail, we might have to produce a 100 or so more graduates every year than our own "needs". But what about the internal brain-drain about which we seem to be helpless, but which does not attract the same degree of attention? Suppose we did prevent these 100 medicos from going abroad, will we be able to deploy them to areas where they are needed most: the family planning programme or the public health needs of the rural sector? Are we making the best use of the doctors we already have in the country? In this context, another legitimate question that may be asked is, what are we doing about the internal brain-drain of the educated from the rural into the urban areas? Does not our whole educational system facilitate this internal "brain-drain"? And, what about the "brain-drain" arising from mis-matching of professional and scientific personnel with the requirements of the positions in which they are employed? Is this not a matter of equal, if not greater, concern? And unless we can design policy instruments to alleviate the question of this internal "brain-drain", may we not be accentuating the problem of the "unutilized" or the "under-utilized brain" by any hasty steps to stop the outward flow of middle and high level manpower?

MINISTRY OR INTER-MINISTERIAL COMMITTEE OF SCIENCE

Rajendra Pal Singh

PERVASIVENESS of science in the net-work of national activities is also reflected in the programme of the Government; in fact, in all programmes of socio-economic and industrial development science has become an essential input. A large number of the Government departments/organizations, therefore, have a commitment relating to scientific research and development in varying shapes and measures.

We have now under the Government of India five major scientific organizations each with a well-knit system of its research laboratories having a mission-oriented programme in a particular broad scientific field; these organizations are: (*i*) Council of Scientific and Industrial Research to answer the technological needs of a wide range of industries, (*ii*) Atomic Energy Commission for promotion of atomic energy for peaceful uses and allied matters, (*iii*) Indian Council of Agricultural Research, (*iv*) Indian Council of Medical Research, and (*v*) Defence Research & Development Organization. In addition, the 'research and development' effort is also pursued in a large number of departments which serve largely as executive agencies for implementation of government programme in their respective fields; the research and development is conducted in these departments in order to keep their resources in terms of man and material as well as professional methods adequate for their present and prospective needs. Instances of such departments are the various scientific surveys like, Geological Survey of India, Survey of India, etc., India Meteorological Department, Medical and Health Department and other agencies concerned with developmental programmes. Even pure regulatory departments like Police and revenue collecting agencies, which generally do not employ technical personnel are also developing in some of their fields of activity the professional skills with the help of modern researches in relevant disciplines. Lastly, the universities have responsibility for basic research in all natural and social sciences, and the results produced in these researches become essential inputs to the applied work being done in mission-oriented laboratories and institutions.

All these agencies are fully-financed by the Government. The resources invested in research and development by the private sector are, however, negligible. The industry has not shown any appreciable interest in research. In our situation where government is more or less the sole financier for promotion of scientific endeavour, it is a matter of immense significance for the Government to ensure that the national science policy and priorities are evolved and articulated to our needs and contexts, and the scarce resources in terms of money, man and material are utilized for optimum results.

Problems of Broader Perspective

All the scientific departments and organizations have a duty to adequately carry forward their respective programmes of research, and equally important aspect is that they should function in a national scientific setting and contribute to the achievement of national goals. The matters, which cut across the departments and organizations and have to be viewed in the broader perspective of national goals, are, for example: (*i*) the order of priorities for research and development in various fields, (*ii*) a broad pattern of financial support to sectoral research, such as, agriculture, and other national resources like power, etc., atomic energy and industry, (*iii*) whether 'prestige science' like space research, particle physics and molecular biology should claim the scarce resources of our laboratories, (*iv*) personnel policies for scientific manpower, and (*v*) assignment of research out of multi-disciplinary areas to one or the other organization out of many to whom it can concern. These subjects are illustrative only. The problems of coordination of activities of different institutions are, similarly, many and of varied character, right from exchange of personnel between different organizations to the avoidance of unnecessary duplications in research; these problems, in fact, are multiplying as the Science is advancing and acquiring more and more multi-disciplinary character.

Need for a Focal Point

As these problems cut across the institutional boundaries, they can be adequately managed only from a suitable focal point in the Government. Hence the need for an organizational system, which can ensure a sound national policy and laying down of well defined priorities for science and technology, and effective implementation of this programme in a coordinated manner. Organizational devices, so far tried to resolve this problem, have been either a Ministry charged with the functions of coordination or a supra-ministerial committee.

A Nodal Ministry for Science

India has experimented with the Ministry pattern for evolving national scientific policy and overseeing its implementation. At the time of Independence, the Ministry of Education had responsibility for both education and science. On May 23, 1948, a new Department of Scientific and Industrial Research was created in the Government with an operational responsibility of the CSIR (with the exception of patent advisory committee and the work of industrial liaison which were transferred to the Ministry of Industry and Supply) and the Board of Atomic Energy Research, as well as with the general role of coordinating the work of scientific research of other Ministries of the Government of India. For the first time, attention of the Government was focussed on the common problems of scientific research and at the Government level an agency was created to bestow its whole-time attention to this subject. On December 26, 1950 this Department was replaced by a new Ministry of Natural Resources and Scientific Research with an added responsibility for development of natural resources like mines, geological survey, power and irrigation. This reorganization, however, was done in the interest of administrative efficiency and effecting economy in administration rather than for strengthening the arrangements for science policy; the promotion of the Department of Scientific Research to the status of a Ministry was only incidental.

In 1957 it was realized that separate Ministries for "Education and Natural Resources and Scientific Research" gave rise to problems of coordination between education and scientific activity and on April 17, 1957, these two Ministries were merged to form the Ministry of Education and Scientific Research. This arrangement, however, did not work for long, and for the purpose of affording necessary status and attention to scientific research, this Ministry was again split up on April 5, 1958 into (*i*) Ministry of Education and (*ii*) Ministry of Scientific Research and Cultural Affairs. Again in November 1963, as a result a general plan for reorganizing the Ministries and departments on a more rational basis, a unified Ministry of Education, with two departments under it, namely, (*i*) Department of Education, and (*ii*) Department of Science, was created by merging the two Ministries of (*i*) Education, and (*ii*) Scientific Research and Cultural Affairs. In February 1964, the division of the Ministry into two departments was done away with for reasons of administrative convenience and efficiency in coordination. In January 1969 the name of the Ministry was changed to the Ministry of Education and Youth Services to give emphasis to youth problems and the urgency o

measures for promoting their all-round development. This Ministry, however, continues to be responsible for nodal functions in Government in regard to general matters of scientific policy and its implementation, and attending to inter-ministerial and other common problems of scientific institutions, like, regulation of supply of scientific manpower and "brain-drain" etc.; it also has administrative responsibility for operation of CSIR and Scientific Surveys, like Survey of India, Botanical Survey, etc.

While adhering to the Ministry-based nodal agency, the Government have tried to find out the most workable arrangement for attending to scientific problems from a central point, and in this anxiety they have experimented with frequent changes in the allocation of scientific research at the ministerial level; but this Ministry-based system has not been able to either inspire confidence or assert its authority for discharging its responsibilities in this regard. The Scientific Policy Resolution of 1958 continues to be a pious hope of the Government, nor has it been reviewed despite its being a qualified success. As observed in the Presidential address to the Governing Body of CSIR on July 15, 1967, by Shrimati Indira Gandhi, the Prime Minister of India, the "Science is sliding back" under the leadership of this Ministry. In certain quarters a suggestion has been made that a separate Ministry of Science should be created for this purpose. It has to be noted in this connection that since the proposed Ministry will also have the essential features of the Ministry-based pattern, with which we have had long trial, there is little change of a Ministry of Science being able to make any better success; a change in the name of the nodal Ministry dealing with Science is not of much consequence.

Weakness of Ministry-based Pattern

There are inherent weaknesses in the Ministry-based pattern for effective working. It has to be recognized that a nodal Ministry dealing with science must also have operational responsibility for certain scientific institutions in order to gain, on a continuing basis, necessary information and practical experience of the problems and live situations encountered by the scientific institutions; but at the same time it will not be possible for such a Ministry to include in its jurisdiction all the agencies largely concerned with science and technology. Certain areas of research, like, defence, railways, agriculture, etc., have to remain with their respective user Ministries for the needed intimate link between the two. In fact it is being realized that in all areas research is best conducted and utilized when it is located closest to the user. Such a Ministry, therefore, can have in its administrative

charge only some of the research agencies. It will not be a valid assumption to expect that despite its being an interested party in the actual operation of some of the scientific institutions it will be able to objectively deal with aspects of finance, allocation of priorities and assignment of multi-disciplinary projects amongst the competing claimant institutions, planning for manpower and other resources for all institutions. The Ministry will have to face trying situations in handling these matters particularly in view of the pressing demands over highly limited resources of the country. The Ministry may not be able always to inspire confidence of the sectoral sciences lying outside its operational jurisdiction. Moreover, the nodal Ministry will normally be expected to perform the role of overseeing the implementation of the national scientific policy including, to a certain extent, the internal performance of the individual scientific organizations falling outside its operational jurisdiction. It is doubtful if a Minister would be able to supervise the performance of another Minister. It may be relevant to state here that the experience of the Ministry of Education in India in regard to exercise of supervision with regard to implementation of scientific policy resolution and other related matters would bear out this inference.

Ministry of Science in U.K.

Like India, the arrangements for nodal responsibility for science in the U.K. are based on Ministry pattern. At the time of creation of the Office of the Minister of Science in 1959 the Prime Minister described his duties in these words: "The Minister for Science is responsible to Parliament for the Council of Scientific and Industrial Research, the Medical Research Council, the Agricultural Research Council, the Overseas Research Council and the Nature Conservancy and is Chairman of the five Privy Council Committees to which they report . . . . The Minister for Science will also exercise Ministerial functions under the Atomic Energy Acts and will exercise supervision of the programme of space research . . . . Other Ministers remain responsible for the scientific establishments within their own Departments; but the Minister for Science is responsible for broad questions of scientific policy outside the sphere of defence and is advised by the Advisory Council on Scientific Policy on general questions which relate to the whole field of civil science." In terms of this charter the Minister for Science dealt with the question of formulation of broad scientific policy in the country and the operations of certain Research Councils.

Realizing that the arrangement did not work adequately, the

Committee of Enquiry into the Organization of Civil Science headed by Sir Burke Trend, in their report submitted to the British Government in October 1963, recommended wider powers and responsibilities for the Minister of Science, such as, assessment of financial requirements of the scientific agencies and settling them with the Treasury, powers to exercise real and effective supervision over the whole field, general responsibility for review of the whole field of civil scientific research for rectifying deficiencies and avoiding unnecessary duplication and aligning sectoral efforts to national needs. The Committee, among other things, suggested that, "The Minister for Science with substantive functions on the lines which we have prescribed would naturally need to maintain close contact with his colleagues in the Government, particularly those whose departmental functions include responsibility for some measure of research." (p. 47, Report of the Committee of Enquiry into the Organization of Scientific Research, U.K., October, 1963).

It will be observed that these recommendations of the Trend Committee follow from the ineffective functioning of the then existing Office of the Minister of Science for nodal responsibilities; the British Government, however, did not appreciate the strength visualized in additional powers and responsibilities suggested by the Committee for dealing with practical problems involved. The recommendations, therefore, were not implemented, and in 1964 a new Ministry of Technology was created with the responsibility for Atomic Energy Authority, National Research Development Corporation and the research stations of the Department of Scientific and Industrial Research (which was dissolved in 1965). The jurisdiction of this Ministry has been gradually enlarged to include a number of other engineering industries. The function of dealing with general scientific policy, however, has continued with the newly created Department of Education and Science. With the creation of a separate Ministry of Technology, to which were transferred a number of research organizations from the Office of the Minister of Science, the new Department of Education and Science did not have even the capacity and competence which was enjoyed by its predecessor, namely, Office of the Minister of Science, for dealing with general scientific matters. Though an alternative system for dealing effectively with national science policy and overseeing its implementation is still to be installed in the U.K., the experiments made with the Ministry based pattern and the attitude reflected in not accepting the recommendations of the Trend Committee in this regard amply show that the British Government is not sure of the effectiveness of a Ministry handling these inter-Ministerial problems.

Inter-Ministerial Committee Pattern : U.S.A.

The alternative pattern of an inter-ministerial committee seems to be of greater validity as an effective arrangement to evolve and implement scientific policies and priorities. In United States, the system, in essence, is one of inter-institutional committees. In addition to the services of the Special Assistant to the President for Science and Technology and the permanent Office of Science and Technology in the Executive Branch of the Government, the President has available to him the advice and assistance of the following groups and agencies: (*i*) President's Science Advisory Committee, (*ii*) Federal Council for Science and Technology, (*iii*) National Science Foundation, (*iv*) National Academy of Sciences, and (*v*) Bureau of the Budget. These groups and agencies include not only outstanding scientists and engineers drawn from universities and industrial and private sectors but also from the concerned departments of the Government.

France and Germany

In France, the overall policy of scientific research and its implementation is the responsibility of the Internal Ministerial Scientific Research Committee which is assisted by an Advisory Committee. The Internal Ministerial Committee is composed of those Ministers who represent the ministerial departments principally conducting scientific research, such as, education, industry, agriculture, public health, communication, etc., and also includes 12 members appointed for their scientific qualifications. The Committee is chaired by the Prime Minister. In the Federal Republic of Germany also there is no single Federal Agency for controlling the national science policy or directing research. There is, however, an Inter-Ministerial Committee for Science and Research which under the chairmanship of the Federal Ministry of the Interior. It is comprised of the Federal Ministries concerned with the development of science and research in their respective fields of activities. The duties of the Committee are to promote exchange of information based on experience, to harmonize the development measures taken by each department and to deal with vitally important questions of research affecting the Federal Republic as a whole. This pattern, in fact, is now considered the world over as the most workable arrangement for the peculiar problems of the scientific 'research and development'.

India : Scientific Advisory Committee to Cabinet

In India a half-hearted attempt has made with a supra-ministerial

committee called the Scientific Advisory Committee to the Cabinet (SACC), which was set up on May 30, 1956 consisting predominantly of scientists. Its charter was to advise the Cabinet on (*i*) the formulation and implementation of the Government scientific policy, (*ii*) coordination of scientific work between the various Ministries and between Government and semi-government and non-government scientific institutions in the country including universities, and (*iii*) scientific and technical cooperation in the international field. The SACC was expected both in terms of its charter as well as on account of its being an apex body of scientists to help Government to lay down national priorities for scientific activity and to ensure effective performance of scientific institutions with the help of necessary resources and working conditions. It is a fact that the scientific institutions and the scientific community in India had pinned their hope for needed guidance and support to this apex expert body. Whereas the Committee did bestow adequate attention on the personnel problems like higher pay scales and status for the scientists, it failed to create an impact with regard to other matters of science policy and its implementation. The contribution of the Committee in regard to pay scales for scientists lower than the Directors of the national laboratories and similar institutions was insignificant.

The SACC was not able to influence much the programme and implementation of scientific activity in the country and the gaps and imbalances in the progress of science have not been rectified. The Scientific Policy Resolution of 1958 has not been revised in the light of the experiences and future requirements except for the electronics industry (for which Bhabha Committee Report is indeed a comprehensive document with a plan for its future development). Almost the entire field of science and technology shows little impact of SACC. The agricultural sector has not generally received the support due to it in view of its present and prospective significance in the life of the nation. There is a complete absence of a clear policy in the field of technological research and the scientists and administrators working in the laboratories are still debating on adaptation versus original innovative research. Any attempt on the part of the SACC for a critical review and evaluation of the results produced by the scientific department/institutions is conspicuous by its absence from its record.

Committee on Science & Technology

The SACC was reconstituted in August 1968 as Committee of Science and Technology (COST); with enlarged scope and membership. It now includes, in addition to scientists, a social scientist and

a statistics expert on it. It has also been provided with its own secretariat which has yet to be strengthened to be adequate for the task.

The lack of independent secretariat for the SACC has often been cited as the main reason for the failure of the Committee. This seems to be a mistaken notion. Secretariat cannot be a magic answer to the capabilities and the competence required of a Committee of this type. SACC had no regular programme of work and it functioned in a casual manner discussing things as and when they were brought to it by one of its members. That the Committee did not for all these years realize the handicap on account of lack of secretariat assistance and that it did not take effective steps for creating adequate staff assistance are themselves a pointer to the Committee's casual approach and lack of seriousness. The major weakness of the Committee, however, lay in its composition. Science in India has yet to secure its appropriate status in the Government for which support at the highest level on a continuing basis is of greatest significance. Expenditure in India on science and technology is only 0.3 per cent of the GNP, which is one of the lowest amongst the developed and developing countries of the world. Therefore, any such Committee for performing its effective role in our context would require a much higher status and political support on a continuous basis.

Some Suggestions

COST is undoubtedly an inter-institutional body of scientists and experts, but its recommendations would, as in the case of SACC, lack in the sanction which can come only from built-in political support. It is essential that the Committee should be revamped and reconstituted by including in it the Ministers concerned with departments with work of sufficient scientific content, along with a number of scientists who are eminent in their own right. The Committee should be chaired by the Prime Minister. It may be renamed as Inter-Ministerial Committee for Science and Technology. The scientists should not be chosen to represent scientific institutions like CSIR, AEC, ICAR, etc., as has been the practice in the SACC and the COST. It is sometimes apprehended that in the absence of the heads of the major scientific organizations on this body, the cooperation needed for implementation of Committee's recommendations would not be forthcoming. The decisions of any committee and more so of the one which deals with science should attract necessary cooperation and compliance largely on the basis of their merit than from the participation in their making by the heads of the institutions

concerned. Moreover, with the presence of the Ministers on this body the necessary cooperation of the institutions and the Ministries would not be wanting.

With the status and support which will accrue to it from the inclusion of Ministers among its membership, the Committee would be able to attend adequately to the problems of overall planning, coordination and evaluation of scientific and technological activities of the nation. As public leaders, the Ministers will also bring in the citizens' points of view to bear on our scientific policy and its results. In view of the presence on this body of most of the Cabinet Ministers, the need for a separate examination by the Cabinet or its Sub-Committee will be obviated.

The scientists members of this Inter-Ministerial Committee on Science and Technology should constitute a separate advisory committee to the main body which should meet more frequently for detailed deliberations on the matters from scientific and technical angles. In addition to consulting this permanent advisory committee, the main body should seek the advice from specially constituted panels on specialized matters before taking decisions. The need for an adequate secretariat assistance of appropriate nature is, indeed, unexceptionable.

SCIENCE IN DECISION MAKING

Ram K. Vepa

THE implementation of the Scientific Policy Resolution (enunciated in 1958) in the last eleven years has given rise to a considerable degree of criticism. While scientific facilities have expanded appreciably in these years, there is a feeling that even, today, due recognition is not being given to the important role that scientists can play in policy making and in the life of the community; the problem of 'brain drain' of which much is talked about has focussed attention on the unsatisfactory conditions of work of the scientists and the place they occupy in society. In this article, attention will, however, be paid on the application of the scientific techniques in decision making and the manner in which this can be increased to offset the often irrational and illogical forces that seem to motivate society in this country.

Progress in the Infrastructure of Science

The progress made in the physical expansion of scientific and technical facilities during the past 11 years has indeed been impressive. Beginning with the National Physical Laboratory in 1950, there are today more than thirty specialized laboratories functioning under the Council of Scientific and Industrial Research (CSIR). These represent such diverse fields as Physics, Chemistry, Metallurgy, Food, Pharmacy, Leather, Electro-chemistry, Electronics, Mining, Public Health, Engineering, Aeronautics, Petroleum, Geophysics, Oceanography. Besides these, there are Regional Research Laboratories at Hyderabad, Jammu, Jorhat and Bhubaneswar as well as three industrial museums and a National Scientific Documentation Centre.

Other organizations in the country also conduct surveys and research schemes; those are the Botanical, Zoological, and Geological surveys of India, the Central Water and Power Commission, and the Oil and Natural Gas Commission, Standardization is dealt with by some of the national laboratories as well as the Indian Standards Institution. Centres of advanced study have been established in biophysics at Madras and in theoretical physics at Delhi. The Atomic Energy Commission operates a number of establishments in the country

for the prospecting, and utilization of ores, as also the nuclear reactors at Trombay and nuclear power stations at Tarapore and Rana Pratap Sagar. The Committee on Space Research conducts research on rocketry at Thumba and a second launching station is expected to be set up shortly on the East Coast.

The country has also developed a large number of high grade technical institutions which provide training facilities in all major fields of technology both at the undergraduate and postgraduate levels. In addition, considerable facilities are being offered for overseas study in specified fields at advanced levels.

While the general record of progress of scientific research is quite impressive, there are, however, danger signals that all is not completely well with the pace or impact of scientific development in the country. One of the important of such signals is the continued Brain Drain from the country of technical personnel such as Doctors and Engineers to advanced countries such as the UK and the USA. An outflow of talents and abilities to other developing countries would not be particularly alarming; in a sense, it would be this country's contribution for the economic advancement of countries less well placed in scientific and technical manpower; it would further provide challenging opportunities to the young scientific and technical personnel—challenges which India might be unable to provide. But a constant one-way flow to countries such as the USA, Canada, or UK represents a serious drain on the already strained financial resources of this country; it would indeed be ironic if accepting aid from these countries on the one hand, India should be supplying trained personnel to them representing considerable per capita investment by the country.

Another gloomy facet to this problem is the rising level of unemployment amongst scientifically trained personnel. It is somewhat paradoxical but true that in spite of the vast requirement of technologists, India's stagnant industrial sector is unable to absorb even the modest outflow of her academic institutions. In fact the brain drain that was mentioned in the previous paragraph is one consequence of this inability to find suitable jobs to all the persons trained at considerable cost. The number of unemployed engineers is said to be around 50,000 including 20,000 graduate engineers and is posing a problem of grave dimensions to the government leading to frustration and social unrest. It has been estimated that the un-employment amongst all the scientific personnel is about 10 per cent while "mis-employment" (in non-technical jobs representing to a certain extent a waste of the training undertaken) is about double this number. That there

should be such anomalies in a developing country like India indicates a failure of matching between the creation of technical facilities and the provision of new employment opportunities.

The third distressing aspect of the Indian Scientific scene is the poor impact scientific research is making on the industrial output of the country. A private research foundation estimated recently that the processes patented by the laboratories operated by the CSIR (the foremost scientific agency) contribute as little as $\frac{1}{8}$ of 1 per cent to the total industrial output estimated to be around Rs. 4,000 crores. That an organization on which the country spends as much as Rs. 17 crores per year should contribute so little to the economic growth of the country is indeed a matter for serious concern. This is particularly so when it is realized that the CSIR was established primarily to conduct what might be called 'applied' research that could be exploited industrially. And yet the National Research Development Corporation which is the agency set up by the government for industrial exploitation of processes patented in government laboratories has to its credit patents providing it with only a limited income of Rs. 20 lac per year. There is surely cause for concern that an agency from which the country has a right to expect a significant contribution does in fact provide so little. The poor impact of scientific research in industry has lead many other undesirable effects such as indiscriminate foreign collaboration, undue dependence on foreign research, a variety of processes making standardization difficult and constant outflow in technical fees and royalties.

Impact on Decision Making

If the impact of science on industry has been poor in recent years, that on decision making has even been less so. This is surprising since 'Operational Research', first developed during Second World War has become a fairly commonplace tool of decision making in most advanced countries. With the simultaneous development of high speed computers, many problems which formerly were attempted to be solved through intuition or guess work are now fed to the computer for a possible answer. Admittedly, many administrative problems are more than mere mathematical equations; and many other factors—human, social, political, etc.—will have to be taken into account in arriving at a final solution. But there is indeed no justification not to possess basic data nor alternative models from which a choice can be made based on the above factors. Again and again, it has become a fashion in India to talk eloquently about the problems facing the country without the slightest attempt at quantification or data collection.

although the tools for such a rationalized approach are often rea
available.

Consider, for instance, the recurring problem of the locatior
industrial plants; one remembers the considerable public agitations
grew around location of the fifth steel plant and the broader quesi
whether a steel plant should be put up at all in the near future.
such issues, it should be possible to identify the various parame
involved, and arrive at a quantified picture of the relative merits of
location of the plant. The final authority deciding it will undoubte
take other factors such as regional backwardness into account
decide, if necessary, on the second best location; but both it and
country have a right to know what is the purely objective assessm
of the merits of each location. Similarly, the larger question whet
a steel plant should be established at all must not be made to depend
the emotional outbursts of misguided youth but on such identifia
sectors as the likely demand for steel in the near future and, wha
more important and readily forgotten, likely alternative uses for
considerable resources that need to be invested on the steel pla

Or take the river waters dispute which threatens to embroil gc
relations between a number of states such as Mysore, Maharashi
Andhra Pradesh, Madhya Pradesh and Gujarat. Surely, it is not
difficult, even with the existing techniques, to set up optimum utilizat
models that would be in the best interests of the country as a whole a
which should be readily accepted by all the political parties involv
Political executives should regard it as a sign of maturity, rather th
of weakness, to accept unconditionally the objective findings of techni
personnel—provided, of course, that such findings are themselves
vitiated by bias. After all, what every good citizen of the coun
wants is that the waters of these rivers must be utilized fully so as
benefit all the areas and an attitude of mere reservation without bei
able to use it in the near future should be condemned by all.

The problem of regional imbalances is again another issue on whi
much heat is generated but comparatively little light. That regior
imbalances should be redressed as much as possible will be read
admitted: but how to identify such backward areas and the best manr
in which effective assistance can be given are points on which t
agreement is not so unanimous. Here again, the matter should not
left to street agitations whether a particular area is to be considered
backward or not. Quantified data, already available, can be suppli
and the several assistance schemes can be examined to see which
them are likely to be most effective. Agreed economic indicators can

evolved to determine the degree of backwardness and conclusions arrived at on this basis must be accepted on all sides (It must be admitted however that at times the very data itself on which such conclusions are based is questioned making agreement even more difficult).

Another vexed question is the role of the public and private sector in the national economy and the relative weightages that must be accorded to by either sector. Apart from those who, out of ideological considerations, support either one of the two sectors, the great bulk of intelligent citizens would like to see an "optimum mix" of the two sectors so that the country might benefit most. The proportions of such a mix would depend on such factors as capital investment required, managerial skills available, internal and external markets, and profits likely to accrue; based on such factors alternative models can be built up which would present the overall picture so that there is a rational basis for making a choice instead of depending merely on picturesque phrases such as "Commanding heights".

The problem of unemployment amongst scientific and technical personnel is itself a problem where with a better match between educational facilities and employment opportunities, this grave disproportion would not have arisen. But why one is inclined to ask, was such a situation allowed to arise in the first instance; surely, it should have been possible, with a fair degree of precision, to compute the employment (and the nature of such employment) likely to be created and to restrict the expansion of educational facilities to meet this demand. It would seem that not much thought had been given to such matching in the past although a number of studies have been conducted on manpower planning; but in any case, the failure to plan with care has resulted in an unfortunate social situation where a large number of trained personnel have to do without satisfactory livelihood.

Or take the case of the 'sacred' cow which admittedly rouses strong emotions as it did in November 1966 in Delhi. But such emotion apart is there no "economics of the cow" which would bring home to the country the total cost of keeping decrepit cattle alive and the possibility of rational solutions for their alternative utilization. If the sentiments of the people do not allow such solutions, they would need to be educated gradually so that they get reconciled to them: but if such studies on an objective basis are not undertaken, is it any wonder that irrational prejudices and emotions hold sway making a logical solution difficult, if not impossible, leading ultimately to a strain on the country's financial resources.

A few examples have been listed above of current problems where there is need for greater application and scientific process in decision makings. There are indeed dozens of smaller problems that arise daily in the work of everyone where decisions are to be taken not on whim or fancy, but on quantified data and an objective analysis. What is needed is that the "scientific temper" must permeate more and more areas of decision making and that mere intuition and hunches taken out of it as far as possible.

Some Suggestions

In order that science should exert a greater, more positive influence on Government, in future, it is necessary that the scientific policy resolution of 1958, which concerned itself with Government support to science, should also operate in a reverse fushion—how can science support and make possible better government? A few suggestions will be made in the rest of the paper which cumulatively might help to promote a greater scientific spirit in government policy making.

An obvious solution, advocated by some, that scientists must be inducted into the policy making levels of the government may be the simplest but least productive. Apart from the fact, that the number of such persons who can be so inducted, will be necessarily small compared to the total requirement, there is no guarantee that a "scientist" outside his own field of specialization is any more 'scientific' than the intelligent layman. It would further amount to a misuse of scientific experience to be lost in the administrative jungle . . . with probably much loss to science and little gain to administration. This does not however mean that scientifically trained personnel with an inclination for administrative work should not be allowed to opt for it: in fact, with the increasing complexity of administration there is need for a body of persons who while not being professional scientists, know enough of the scientific disciplines to establish meaningful relationship with the technical advisors.

Conscious efforts must be made to provide a minimum scientific knowledge in high schools and colleges so that every citizen, whatever the profession to which he belongs, has some knowledge of the scientific process. Science should be popularised through such audio-visual media as the Cinema, Radio and the T.V. so that the natural curiosity of the young is aroused. With men taking giant strides in the peaceful utilization of Atomic Energy and exploration of outer space, it is not difficult to excite the interest of the youth in science which can be fastered by Science Talent competitions conducted on a larger scale.

Amongst the public too there is need for a conscious and purposeful dissemination of scientific knowledge—not through the dry-as-dust technique of the pedagogue, but the more interesting possibilities offered by new media of communication. In the rural areas, science centres should be established on a large scale so as to provide useful information to the agriculturist and, generally, act as a forum for purposeful discussion on current topics. The Vigyan Mandirs were at one time conceived to function in this manner but have since been closed down; in any case, they were too few and ill-organized and consequently the impact on the public was almost nil. Instead of one such Mandir in a State, there should be dozens of them to stimulate public awareness in the scientific spirit.

In the courses offered at the National Academy at Mussoorie, as well as at other training institutions for higher cadres of Civil Servants, there should be a greater scientific content since most of the recruits have a non-scientific background. It is therefore doubly necessary that a course in the vistas of modern science covering such disciplines as Biology, Physics and Chemistry should be provided so as to inculcate in the young administrators something of the new spirit of science .... For those who are likely to work in technical ministries, at the central and State levels, more specialized courses must be provided...through refresher courses at periodic intervals. Thus a person working in the field of Oil needs to know something of geophysics and the science of petroleum while one in the ministry of steel must know about metallurgy and Electro-chemistry. But a basic course in modern science must be prescribed as a compulsory subject for all civil servants who will in the course of their career be required to deal with a number of scientific matters. A course on Modern Aids to decision-making such as Computors, PERT, and critical path studies will undoubtedly be of use to the majority of the young administrators.

In the actual process of administration, for instance, it is possible to introduce greater reliance on objective criteria based on specific field conditions. Performance evaluations of subordinate personnel and offices must be based on such criteria and these should as far as possible be quantified. Confidential reports should be based on such assessments instead of depending merely on personal whims and fancies of the superiors. Such reports are likely to find greater acceptance amongst the rank and file instead of being regarded, as now, as merely devices to impose discipline. In this regard, many agencies are taking steps to provide suitable targets to employees at the beginning of the year and assess at the end of it how much has been realised. It is also satisfying that some attempt is being made for rational personnel

placement by matching job requirement with skills and aptitudes rather than haphazard postings of persons which often leads to mismatch in ability and inclination. Such technique needs to be utilised even more so that personnel administration is made more rational and more effective.

As regards the scientific institutions themselves, there is need for greater autonomy to the institutions and within an institution, to the individual research worker. On the other hand, given that freedom, there should be a more critical evaluation of the performance by an objective body not merely on the basis of the papers published and seminars attended (which can be legion without any material result) but on the actual impact of the work either on industry (if in the applied field) or in generating new thinking on the subject (if in the pure branches). One fears that today scientific effort is not always critically evaluated with the result that a considerable amount of second rate work is allowed to continue at great expense and little benefit. In fact, the scientific spirit of judging ultimately by the result is nowhere more needed than in the scientific field itself where, paradoxically, there prevails a spirit of favouritism and professional jealousy.

There is need too for a complete re-orientation of the scope of scientific research which in the past has been too much fashioned on the Western model with little relevance to indigenous requirements. This partly is due to the fact that the majority of the top scientific personnel in the country have had their advanced training in the UK or the USA and prefer to continue the same lines of research; it may also be due to the fact that such research is "paying" in attracting invitations to international seminars and visiting fellowships at western academic centres. The result of this effort however has little impact on indigenous problems which are either left to second rate personnel or is neglected completely. However, unglamorous it may seem, such research will pay more dividends to the country in the immediate future in making possible a greater utilization of local raw materials and avoidance of the import of foreign goods. Scientific research institutions, particularly those which are meant for applied research, should not hesitate to take up projects that have a relevance to local situation rather than the more spectacular, but relatively less useful, projects. This again requires a strong and purposeful leadership of the institutions and a clarity on the objectives for which the institutions have been established.

Ultimately a greater spirit of science must permeate the entire country so that both the policy makers and the common citizen look

to the scientific approach for a rational solution of the country's problems rather than to gimmicks and short-cuts based on prejudices. To motivate a vast nation such as India, steeped in ancient traditions, with the new spirit of modern science is no easy matter; nor is it however as difficult as is commonly made out to be. The basic tradition of India is fortunately not anti-science although much of the ritual is; if science is fundamentally commonsense, intelligently used, there is no reason why the spread of science should be particularly difficult. But this is a task not merely for the scientist and administrator; but for all those who have the good of the country at heart. A new scientific policy resolution must be formulated indicating the mutual support science and government will give to each other; for it is not merely enough for government to back science with adequate funds. Science and scientists have, in a turn, an obligation to the community and the country in spreading the scientific temper, on as large a scale as possible, so that government decisions in future are—and are seen to be—more logical and rational than in the past.

BOOK REVIEWS

THE BRAIN DRAIN, By WALTER ADAMS (Ed.), the Macmillan Company, New York, 1968, p. 273.

This book comprises sixteen papers presented at an international conference on the brain drain held at Lausanne in August 1967. Among the contributors are such distinguished economists as Harry G. Johnson, Brinley Thomas, Kenneth Boulding, Charles P. Kindleberger and Hla Myint. The central issue of discussion was the adequacy or otherwise of the factor mobility theory of international trade (with its implicit assumption that such movements are beneficial to the receiving and sending countries) in explaining the brain drain phenomenon.

According to this theory, the factors of production (of which human capital is but one example) move across national frontiers in response to their prices. Therefore, in conditions where human capital is free to seek the highest award (*i.e.*, an income equal to the value of its marginal product), it will tend to flow in directions where it can maximize its contribution. In other words, emigrants invariably gain by migration (except in cases where they are motivated by non-economic considerations). The receiving countries also gain; as they acquire additions to their stock of human capital at costs lower than what they would incur were they to rely exclusively on domestic sources. The operation of the law of diminishing returns in their search for domestic talent and the cost differential in the production of human capital between the receiving and the sending countries suggest this possibility. But, do sending countries also gain in the process? Yes. According to Harry. Johnson, following the logic implicit in factor mobility, brain drain can be expected to raise total world output which, in turn, should prove economically beneficial to the world as a whole including the sending countries. Gains accrue to the sending countries either in the form of emigrants' remittances to their family members, or through basic scientific discoveries made by the emigrants or through better quality, lower-cost products manufactured with the help of the services of emigrants.

A deficiency of the "international model" is that it does not take into account certain specific cases where sending countries evidently suffer a loss. Oteiza raises the hypothetical case of a country which is at below, or only slightly above the critical mass of scientists and technologists which are considered indispensable to economic development. If the emigration of such high-level manpower causes the country concerned to fall below the minimum level of human capital it needs, the consequence is not to raise the marginal productivity of those remaining but to impede its growth potential. Boulding, on his part, laments the loss of externalities in certain societies caused by the emigration of energetic, young and educated professionals.

Unfettered migration of such personnel can favour only the most advanced and affluent countries, even to the extent of drawing from the less developed ones their potential developmental leadership.

Possibilities such as these should serve as restraints on the feeling of complacency with regard to the brain drain problem likely to be generated as a consequence of the general acceptance of the "cosmopolitan model". Equally necessary, however, is to guard against attempts to resurrect, on the basis of the foregoing, what Johnson calls, "the myth that there is a simple and quick road to development by substituting human capital for material capital as the crucial element in the process". The truth of the matter is that the claims made with regard to brain drain as an impediment in accelerating growth rates of the less developed countries are grossly exaggerated. It is, at best, an index of the structural maladjustments in both the receiving and the sending countries. In the case of the former, it indicates an inelastic supply of certain kinds of skills and professions. In the case of the sending countries, brain drain may be regarded as an index of the lack of balanced growth of the economy. Attempts to tackle the problem should, therefore, be directed to the roots of the problem rather than its exterior manifestations. The operational implication of this policy for less developed countries obviously is to concentrate not on steps directed at producing more skills but on efforts designed to create opportunities for using these skills in the best manner possible. The relevance of this policy to countries like ours which are producing high-level manpower far in excess of their absorptive capacity can hardly be over-emphasized.

The chief virtue of the book lies in separating the elements essential to the dispassionate and realistic understanding of the brain drain problem from the emotionally loaded, pejorative ones. For this reason alone, it merits a close reading by all those concerned with the formulation of policies aimed at solving one of the most unique manpower problems facing the present day world.

—S. P. AWASTHI

MANAGEMENT OF INDUSTRIAL RESEARCH, By E. DUER REEVES, New York, Published by Reinhold Publishing Corpn., 1967, pp. 207.

The book has mainly been addressed to science based industrial concerns functioning in a highly competitive market, characterized by a high rate of product obsolescence on the one hand and a constant pressure for better products, newer services and greater economy on the other. In such a situation, it is postulated that technological competence at the corporate policy level should be of a high order so that research capability in the right directions is created well in time to keep the company in fighting trim—a prerequisite to survival in such situations.

The introduction to the book besides giving the background in which the post-war explosive growth of technology based industries and industrial research occurred but quantises the vast accumulation of new technology which is on the threshold of commercial application. In 1966 the bulk of the current industries in USA was based on technology

developed around 1958 at a cost of about 57 billion R & D dollars. On that date a new accumulation of technology of a value of 125 billion R & D dollars was coming up to the utilization point.

Any company which had bought know-how and plant in 1966, in USA, in effect was only utilizing the 1958 technology and unless it had the technological foresight and vision to catch up with the up and coming technology represented by the 1958-66 technological reservoir quantised at 125 billion R & D dollars), would soon find itself completely out of place. In a situation of keen technological competition, there is a serious need to accept and provide for a high level of industrial research capability and its integration with the management approach to the market and product diversification.

The second chapter on "the nature of industrial research defines it as a business-oriented technological activity for applying science in a manner suited to the company strategy for keeping up an edge over competitors in the technological competition.

The plan of action for company objectives is visualized as a series of combined business and technical judgements. The development of specific research progress proceeds through a series of steps in which business and technical judgements are involved in varying degrees. The point at which primary responsibility should be transferred from those having business responsibility to those in the research organization should be clearly defined to avoid confusion.

The third chapter is devoted to the process of evolving a corporate research policy based on the industrial, technological and market situation at that time and in the following years. The quantum and nature of research needed, and integration of the effort with management planning of the company activities on the one hand and the technological and research infrastructure in company operations on the other.

The fourth chapter deals with the mechanics and timing of the effort to build up technological competence and research capability. A 5-7 year lead time and a 15 per cent growth factor has been shown necessary before a R & D structure could be built up to a point where results could start flowing into company operations.

It has been shown that the risk of using the research laboratory for seeking technological solutions to pressing plant and market problems are too great and that it is very necessary to have a good effort on the long range expansion of technological resources of the company.

The fifth chapter is devoted to a study of different patterns of relationship of a research set-up to the profit centres of the company and the various types of interactions, advantages and disadvantages that can be envisaged.

Internal organizational patterns of the research set-up and the different levels of responsibility and accountability arising therefrom are covered in the sixth chapter. It also discusses the different methods and extent of communication, coordination and control necessary to maximize cost-effectiveness to the company.

Bonding the business objectives and technological strategy of a company based on competitive and fast changing technological areas as a strategy is dealt with in the seventh chapter. It has been shown that a conscious attempt has to be continuously

made to effect a convergence of business objectives and research achievements, inputs into research and commercial operations, business strategy with base costs of market demands, competitors line of action and product development activity. Several models have been postulated to weld these factors into a formidable strategy for survival and growth in the face of stiff technological competition in a highly discerning market. Special attention has been devoted to the marketing strategy for new products emerging from technological and research activities. The effect of comparative price structure of new products in relation to the market pressure for more sophisticated products on the one hand and competitor's offers on the other has been spelled out with an indication of methods to be adopted in various situations.

The earlier part of chapter 8 pertains to the risk evaluation and risk management where a combination of mature technical judgement, and business judgement (of the market, product demand and cost structure) is essential to ensure a high probability of calculated risks paying off. The techniques of evaluating probabilities of making a business success of outputs from research effort is the theme of the latter part of this chapter. The evaluation parameters for exploratory research expenditure on basic research, transition research and development projects have been given as a help to percieve a proper balance of expenditure on each of these in a given context of technological and market situations.

Chapter 9 is devoted to operational tactics in manufacturing programmes where techno-commercial judgements and innovational competence in technology form the basis of decisions of the following nature: (*a*) Utilizing existing plant complexes to best advantage with/without marginal adjustments in process conditions, sequence and equipment; (*b*) Timing and phasing in of new technology and newer plants to the best commercial advantage; and (*c*) Deciding optimum systems to bring in technological adjustments, mutations and complete changes, etc.

In conclusion, it can be said that this book is a good treatise for industrial units operating in a quick-changing and highly competitive technological market. The welding of research objectives, operations and management, with overall corporate strategy for survival and growth is special area which the book has ably dealt with.

—R. T. Thampy

THE R & D GAME: TECHNICAL MEN, TECHNICAL MANAGERS, AND RESEARCH PRODUCTIVITY; Edited By DAVID ALLISON Massachusetts Institute of Technology, Cambridge, Massachusetts and London, England, pp. 322.

In this book, editor David Allison (one of the founding editors of *International Science and Technology* and presently senior editor of *Innovation*) has brought together men who are particularly knowledgeable on one or another aspect of the R & D Game. The book is divided into three parts: The Man, The Environment and The Organization. David Allison provides a lead of discussion in each of these sections.

In Part I: *The Man*, psychologist *Ray Hyman* talks of various investigations into the nature of creativity and their relevance to the world of industrial science. Psychiatrist *Lawrence Kubie* describes some of the inhibiting factors that prevent us from

using our intellectual endowments more constructively. Social scientist *Donald Pelz* (a name familiar to the readers of this journal) shows that maximum autonomy does not necessarily yield maximum technical performance. Social psychologists *Donald Pelz* and *Frank Andrews* find that performance actually is improved when technical people are involved in a mix of activities. Psychologists *Ray Hyman* and *Barry Anderson* suggest some working rules that can enable us to be better problem-solvers.

In Part II: *The Environment*, *David Allison* leads off the discussion of the environment for invention and innovation. *Donald Schon* shows how technological innovation can disrupt the stable state of a corporation, and hence develop the fear of new ideas. *Carl Barnes* shows how the environment can be improved to promote invention. Social scientist *Lowell Steele* says the job of the research manager is to establish areas of mutual interest between the scientists and their organization. Lowell Steele spells out what the technical people expect of their manager. Social scientist *Rensis Linkert* points out that traditional systems of management do not work on the creative people in science and engineering. He describes a system called "participative management", a system that enables the people to participate in their organizations' destinies.

In Part III : *The Organization*, *David Allison* points out how science has the power to cause the organization to set off in new directions, even to cause the organization to alter : structure. *Jack E. Goldman* wl headed basic research at Fo during its first decade, tells wl large companies do and should (basic research. *Jack Morton*, wl heads components research and e gineering at Bell Telephone Labor tories, tells how basic research lea to new technology. In anoth article, Morton points out hc people and management probler increase as technologies increase complexity. *Albert C. Stewart*, chemist in the marketing worl tells of the uneasy alliance betwe scientist and marketer. *John.* *Hoskins* points out how a technolog based company must be designed that it can respond profitably to ne opportunities in the outside world.

One of the purposes of this bo is to bring a note of reality to tl industrial research scene: to disp some myths and to try to descril how the technical world really work This purpose is well served by tl topics taken and the coverage give

Though it is written for the U reader, most of what is said is relev to the Indian context and mo particularly the managing of men the research world. In absolu terms, we may not be spending many millions of dollars on researc but the productivity of research is great significance to us in this dev lopment decade.

This book is essential reading fo all those who frame policies, mak decisions and execute research pro grammes.

—N. H. ATTHREY

EVALUATING, SELECTING AND CONTROLLING R & D PRO JECTS (AMA RESEARCH STUDY NO. 89), By BURTON V. DEA American Management Association Inc., 1968, pp. 126.

Some of the advanced countries are in the midst of industrial research revolution that is affecting vitally th growth rate of the industry to a

extent comparable with that of the Industrial Revolution. The R & D process in industry consists of a number of identifiable steps, such as idea generation and handling, project evaluation, project selection, project control and project completion and termination. The present book is essentially a research report on the survey of the methods employed by several corporations in the United States of America to make R & D project decisions. The information is based on the questionnaire survey on the methods used by various firms, on interviews with selected companies and on a review of the relevant literature. The survey extends over a wide spectrum of industrial complex ranging from aerospace to primary metals and transportation equipment.

It points out very vividly how technologically based companies have recently been concerned with developing effective organizational assistance and procedures to carry out technical idea generation, development, submission and handling. In most industrial firms the formally established R & D organization operates as the major innovating system as also media for industrial change and growth. Basic in these changes are the ideas generated by researchers that is, ideas stemming from an acquired knowledge of their disciplines as applied to the needs of the company. The task of deciding which ideas are to be further developed and given additional resources is usually the responsibility of management. The analysis has shown in an interesting way that only 2 per cent of the ideas that are generated and tried yield successful products. It has also been shown that the company's policies unfortunately often inhibit research specialists from preparing new and profitable projects. It has been suggested that in certain firms which are by no means typical, 70 per cent of the ideas are generated from the R & D group attached to the industry and 20 per cent from patents study group. At the other extreme there are companies in which 60 per cent of ideas are generated by sales personnel and customers whereas only 30 per cent are generated by R & D personnel. The survey has pointedly brought out some of the barriers to the free flow and handling of research and development ideas and their successful applications. Most of these problems are essentially those of human relationship and management.

The evaluation of a project is necessary at all steps, even before the project is selected and running throughout the project and its termination. Although the project evaluation process is a very complicated phase in the dynamics of the project, yet it is equally vital. The survey gives the methods that have been adopted in various companies. The book also gives a brief survey of the recent developments in quantitative methods for the evaluation of R & D projects.

The R & D project selection involves the allocation of the organizational, scientific and engineering resources and various other types of inputs. The major criterion in the project selection process is obviously the long range profitability. Very sophisticated methods have been evolved for the selection of projects and assigning relative importance to projects in hand. Project control, in other words, the methods and procedures used by the firm to control the costs, rate of progress and performance of R & D projects, is an extremely important aspect of the R & D. These project control procedures as practised in various companies have been reviewed in the book.

Project completion and termination

'e important decision problems. his primary significance is based ı the fact that the entire R & D sources generally become available the firm whenever a project is mpleted or terminated. One aspect the problem is the evaluation of ε results achieved from completed d terminated projects. In general, :thods and procedures are few this area. Moreover, there is s evidence of constructive manage-:nt attention here than there is · most other managerial problems. sides the evaluation of the ideas d methods that have been generat-in the R & D, there is second luation and that is the post-nmercialization audit. This last ıse clearly brings out the validity the assumptions that have been de in various stages of the growth the project and in general brings clearly the efficiency of the & D group.

'he book vividly brings out the thods followed in various indus-l concerns to handle all the stages the R & D projects starting from generation of ideas to the post-nmercial evaluation. These problems are extremely complicated in a competitive industrial society and precisely for this reason very sophisticated methods and criteria have been evolved for the judgment at every step. Although the book deals with number of industrial concerns, the methods that are followed have obviously to depend on the nature of the industry. In those industries where the time of obsolescence is very small, the generation of ideas and their successful handling in the shortest possible time is of paramount importance, whereas in traditional industries it is long term planning, that is, of relatively greater importance. The book essentially describes the factual but often not so critical analysis of the techniques of R & D decision making followed in various concerns in the USA and makes an interesting reading. Although, the material presented here is of little relevance to our industry because of the different types of problems it faces, the book will be a very good acquisition to industry, research laboratory and public undertaking.

—V. G. Bhide

THE INDIAN JOURNAL
OF
PUBLIC ADMINISTRATION

Vol. XV October-December, 1969 No. 4

ADDRESS BY SHRI Y. B. CHAVAN, PRESIDENT OF THE INSTITUTE*

I AM very happy to be with you in this Annual Meeting of the General Body of the Indian Institute of Public Administration. As the President of this Institute for the last two years, I have noted the multifarious directions in which the activities of this Institute continue to grow. Fifteen years back, this organization was set up to provide a forum for exchange of ideas on various problems of public administration and to initiate meaningful discussions and purposive research. We find that these aspirations have been fulfilled to a large extent, if not completely. The IIPA has received recognition as a premier institution engaged in the pursuits of public administration not only at the national, but also at the international level. Our representatives have been intimately associated with the working of the Administrative Reforms Commission and with several international bodies. While this should be a matter of satisfaction to us, we cannot possibly rest on our oars. We have to continue to nurture these growth processes with sustained endeavour, so that in times to come, this institution becomes a more forceful nucleus of research and study in the field of public administration.

While an institute of this type necessarily employs many methodologies, it is beyond doubt that its primacy will be retained or relinquished on the basis of its research output. Our country is passing through a dynamic period in which the values, norms, beliefs and ideals of society are undergoing rapid transformation. Public administration

*Delivered on the 25th October, 1969 at the Annual General Meeting of the General Body of the Institute.

cannot remain immune from these powerful impulses and its concepts and techniques must develop the requisite mobility and thrust. New thinking and innovations are evident in practically all branches of administration. Such a situation demands that a body like this Institute maintains a high pitch of research activity and keeps itself abreast of the contemporary situation assuming the role of a change agent. I have noted with satisfaction that the Institute gave considerable research support to the Punjab Administrative Reforms Commission and thereafter, to the Administrative Reforms Commission which has been set up at the national level. The A.R.C. has been generally appreciative of the work which we have done for them. Similarly, the completion of the research project on the study of the "Evolution of the Constitution of India" and the publication of the five volumes which were released by the President of India, have been a landmark. Yet, there are many more directions in which the Institute should seize the research initiative.

II

All of you are aware that recently we took a major step on the path of democratic socialism through the nationalization of 14 scheduled banks. This step has been hailed throughout the country and the popular response and fervour among the masses is a living testimony of the hopes which it has aroused. Considerable follow-up work in organizing a new structure in banking and in working out the precise details of their operations has yet to be done. I hope this Institute will take note of these developments and engage in research and analysis in this important sector.

Current year is the Gandhi Centenary Year. All over the world, celebrations have been held to recollect the teachings and precepts of this frail little man who, by his sheer moral force, unleashed tremendous forces of change and reconstruction. It is true that considerable attention has been given in the past to certain aspects of Gandhian philosophy like its economic strategy, theory of social cohesion, approach to international accord and techniques of peaceful and non-violent struggle. His theory of 'conversion of heart' has also been the object of lively debate. One could not, perhaps, speak with the same assurance so far as Gandhian thought on political organization and public administration is concerned. Not much has been done to rummage through his collected works and explore what structure of public administration he visualized and what image the public functionaries were expected to project in his political order. This is another direction of research in which the Institute could, in the

current Gandhi Centenary Year, make a significant contribution and break fresh ground.

III

A full-fledged centre on Municipal Administration has come up in the Institute for training and research on the problems of urban local government. With growing urbanization all round, this undoubtedly is an important field of study. However, there is an equally important field in which substantial administrative innovations have taken place and continuous experimentation is afoot. This relates to the concept of democratic decentralization in rural local government, which is popularly known as Panchayati Raj. As we scan the country, we find that different patterns of Panchayati Raj have emerged in various States. While this variety of approach is welcome in a vast country like ours with healthy regional diversities, there is room for academic effort to explore the reasons for these variations and to ascertain the broad areas of agreement. Continuous research in the working of Panchayati Raj is essential and I hope that in times to come, we may have an equally well-developed centre on Rural Local Government. Over 70 per cent of our people live in villages and the real test of new techniques in the field of public administration will be the extent to which these large masses can be energized towards constructive endeavour. Sustained thinking is necessary in this direction.

Another area which deserves more attention is that of public sector undertakings. In years to come, the public sector is bound to expand in our country. We will have to make continuous efforts to improve the efficiency of these undertakings and they will have to be proved as financially sound investments. They will also have to contribute to the plan effort of the country in a big way. This will imply critical appraisal of their management and production policies and programmes. There is considerable scope for taking up case studies in this important field. Research in this area can be of value not only for the new units in the public sector but also for those in private sector.

IV

After research, the most important activity in which an institution of this type can engage is training. I have noted that gradually the emphasis in this Institute has shifted from teaching to training. This is a development in the right direction; while the various universities

in the country can effectively take up the teaching of public administration, a specialized activity like training has to be undertaken at a place where considerable professional expertise is available. There was a time when it was believed that initial post-entry training was sufficient and all further learning had to take place on the job itself. With the multiplication of the administrative functions and the attendant specialization, it is being increasingly realized that mid-career training in certain specialized fields is essential even for senior administrators. I am glad that the Institute is doing a pioneering work in organizing short-term Executive Development Programmes in collaboration with the Training Division of the Ministry of Home affairs. These courses on diverse subjects like Budgeting and Financial Control, Techniques of Plan Formulation, Economic Decision-Making, Social Welfare Administration, Performance Budgeting and Development Administration, I am sure, will go a long way to meet the urgent requirements of mid-career training. One important aspect in training is the education of trainers. Unless the personnel entrusted with training inculcate right attitudes and possess the requisite expertise, training can often become not only a wasteful enterprise but even a harmful one. In a parliamentary democracy, it is important that the public functionaries manifest right attitudes towards the citizens and the training institutions and their staff have a major role to play in this orientation. It is, therefore, welcome that early next year, the Institute is proposing to organize a course on the training of trainers.

Linked with training techniques is the problem of producing sufficient training material. I have noted that the IIPA Case Studies Programme, which had a modest beginning, has now matured and more than 60 Case Studies have been prepared on various subjects. The need to develop an indigenous case study programme is great because foreign case studies, though valuable academically, are not completely applicable to our conditions. This is another activity in the Institute which should continue to grow.

While training programmes are valuable for administrators up to a certain level, there are many people at the senior levels in government, universities, public enterprises and private industry, who because of their onerous pre-occupations, cannot remain away from their jobs for a long time. Seminars and conferences are the only method to cater to this type of clientele. I am glad that recently the Institute organized two important conferences of this type. The Conference on Training held in February, which I had the pleasure to inaugurate, brought together on one forum the various training experts in the country—from the Ministries, State Governments, training institutions and other professional bodies. As it was the first conference of this type, its proceedings,

which the Institute has published, will be useful for all practitioners of training. The other Conference on Personnel Administration held in August/September last and inaugurated by Shri Asoka Mehta was another important gathering of experts who had assembled to discuss the implications of the A.R.C. Report on Personnel Administration. I am quite sure that the proceedings of this Conference, which are yet to be published, will provide food for thought to all those who are grappling with this important and delicate subject.

I may also emphasize the importance of publications in the activities of a body like this Institute. While seminars, conferences and even research projects are of direct use to the actual participants, it is only the publication of the findings that reach a much bigger circle. I am glad that over a period of time, the Institute's Quarterly Journal has acquired a distinguished reputation and its special numbers have been particularly useful. I hope that notwithstanding the financial considerations, we shall be able to accelerate our publication effort and continuously feed the universities, the government and other similar institutions with fresh material.

V

An Institute of Public Administration should be, as Paul Appleby said, a model of internal administration. We have not been oblivious of this problem and the Evaluation Committee under late Shri Barve and the Implementation Committee under Dr. Lokanathan did useful work in suggesting improvements in the internal working of this Institute. I am glad that the Executive Council has recently constituted a Working Group to make recommendations on how the administration of the Institute can be streamlined. We expect that this Group will give a comprehensive report covering all aspects of the internal administration of this Institute.

We obviously cannot sit back on our laurels, but have to continuously strive for greater efficiency, competence and effectiveness. It is the fortune of our generation to be working in a period of swift transition where stagnant and stationary values are being discarded in favour of dynamic and resurgent ideals. We are passing through a revolution of rising expectations and every social unit has to work at optimum efficiency. There is no scope for slackening of effort. As in other spheres of human activity, so in public administration, we have to keep our concepts and techniques up-to-date and we can ill-afford to become out-dated or outmoded. In a highly competitive world of today, to remain stationary would almost amount to slipping backwards.

As I said earlier the IIPA has fulfilled our expectations to a large extent. It has continued to grow in the right direction. A large part of the credit goes to the able leadership and the band of enthusiastic researchers that the Institute has been fortunate to get. I am sure that the achievements so far would only serve to whet their appetite for more work and research. I wish them success.

Friends, before I conclude I may join my friend and colleague Shri Asoka Mehta in associating myself with the tribute that he paid for the excellent work that Dr. Khosla did during his tenure. I am sorry that he is leaving the Institute. I think we all wish him all success and good luck, in whatever undertaking he goes to next.

A.R.C.'s REPORT ON PERSONNEL ADMINISTRATION —FAULTY SUPERSTRUCTURE ON FALSE PREMISES

P. R. Dubhashi

THE A.R.C.'s Report on Personnel Administration aims at laying down a pattern of personnel management which would be conducive to the most effective use of human resources in the civil service so that administration becomes an effective means of achieving socio-economic regeneration of the country. In striving to achieve this task, the Commission has taken note of the new dimensions of development administration as compared with the regulatory administration, the new areas of administration which have emerged as a consequence of new policies and programmes for social welfare and economic growth, and the importance of science and technology. In making administration a fit instrument for accomplishing these tasks, the A.R.C., like the Fulton Committee Report, has also laid emphasis on professionalism and the need for matching each job with the man possessing the requisite skill and expertise. Like the Fulton Committee Report, it has also found fault with "unalloyed generalism" which is out of place in an era of science and technology and has underlined the need for greater use of technical and specialized functional services. It has, therefore, adopted a functional approach to personnel management.

The A.R.C. Report, however, does not deal with personnel management in the public administration system in this country as a whole but only with the staffiing of the central secretariat organization and that too not in detail with reference to various departments of the central secretariat nor at all levels. Its recommendations apply to the personnel at the level of Deputy Secretaries and Joint Secretaries and makes only cursory references to the other levels. Also, it is satisfied with illustrative indications rather than comprehensive recommendations.

These limitations are of considerable significance in assessing the adequacy of the recommendations of the Commission. It has not been able to deal with the personnel administration system as a whole because the personnel administration at the state and the district level was left

out to be dealt with by the Commission's Study Teams concerned with state and district administration while for specific branches or departments of administration, like agricultural administration, economic administration or public sector enterprises, the A.R.C. set up separate Study Teams. As a consequence, the subject of personnel administration has been fragmented and the overall approach which one would have liked or expected in the report on personnel administration, is missing. An appraisal of the Report and the recommendations it contains must take into account this very basic limitation in the Commission's approach. By making its recommendations regarding personnel management in the Central Secretariat, divorced from any consideration of personnel management at the level of state secretariats, headquarters departments or districts, the Commission has lost sight of the need for taking an integrated view of personnel administration in a federal country like India.

The 'Functional Approach'

In dealing with the limited area of personnel administration, the Commission has tried to adopt what it has called a functional approach to personnel management. Unfortunately, it has failed to define clearly the term 'functional area' of administration or the term 'function' itself and yet it has based its entire recommendations regarding personnel management on a distinction between the functional and non-functional areas of administration. The basis of the entire Report is contained in the following statement: "Where the post requires a particular academic qualification, or in which a particular specialized experience is essential, it would be in the public interest to draw from the respective technical or specialized functional services for manning even the highest positions. Where, however, these are not the necessary requirements, and the needed specialization can be acquired by training and experience, it would be in the public interest to cast the net wide and choose the best material from generalist as well as specialist sources." (vide para 20, Chapter II, p. 10.) It may be possible to identify clearly "the posts requiring particular academic qualification" which could be filled in by "technical services". Obviously, these include posts like those of Engineers and Doctors. The Report has given illustrations of the posts of District Mechanical Engineers, Chief Mechanical Engineers and the Member (Mech.) of the Board in the Railways which fall in the category of technical services (vide para 11, Chapter III, p.17.) The functional services other than technical services have, however, not at all been clearly defined. In the first sentence of the statement cited above a specialized functional service is supposed to be for filling up posts requiring *specialized experience* but in the

very next sentence indicating the non-functional posts supposed to be thrown open to the generalists or the specialist civil servants, it has been said that needed specialization can be acquired through *training and experience*. It is difficult to see any distinction between these two types of positions. Indeed, no post in government could be treated as either non-functional post or post not requiring specialized experience. To say so is to admit of dysfunctional or *sine cure* position in government which indeed can better be abolished and for which no personnel management of any sort will at all be required. The attempt of the Report in trying to make a distinction without a real difference will be all the clearer when we turn to some of the examples given by the A.R.C. Report to illustrate its categories. Thus, it has combined the posts of Income Tax Officers, Engineers and Collectors as examples of functional posts (vide para 11, Chapter III, p. 17). But it has classified the post of District Development Officer or the Chief Executive Officer of Zila Parishad as non-specialized and belonging to non-functional service (vide para 13, Chapter III, p. 18). On the other hand, the post of the Municipal Commissioner is included in the functional area supposed to be carved out specially for the I.A.S. (vide para 9, Chapter III, p. 16). There is apparently no rational basis for treating the post of a Municipal Commissioner as falling within the purview of a non-functional service like I.A.S. but excluding the post of a District Development Officer from the area specially carved out by the Commission for the I.A.S. In fact, if at all there are any two posts which are close to each other, those are of the Collector and the District Development Officer. Both these posts are typically to be manned by the "area administrators".

The confused basis of the whole approach of the Commission is further indicated by the areas of the posts of Deputy Secretaries which are supposed not to require any particular functional service. These include economic administration, industrial administration, agricultural and rural development administration, social and educational administration, personnel administration, financial administration, defence and internal security and planning. By no stretch of imagination could any of these be treated as non-functional areas or the posts which do not require to be manned by any particular functional service. In fact, these are the major functional areas of administration. Posts in these areas do require both special experience and, in some cases, special academic qualification. There are specialized courses given in Business Management Schools in Personnel Administration and Financial Administration. There are specialized branches of Economics, including industrial and agricultural economics, which are relevant to the economic, industrial and agricultural administration.

There are courses in social work and education which are relevant to social and educational administration. By what stretch of imagination can then these posts be treated as open to persons of all services irrespective of their functional background or experience?

A Fallacious Distinction

Thus, the entire facade of the recommendations of the A.R.C. is based upon a totally fallacious distinction between the so-called functional areas and non-functional areas or functional services and non-functional services. The real distinction is between the technical and scientific service and the administrative service. This distinction is made all along in Indian administration as in the administration of other countries. The technical and scientific services cannot be manned by people except those having technical and scientific qualifications. On the other hand, whatever be the aspects of administration for which the services are organized, if the candidates are recruited on the basis of general qualification, the recruitment is followed by specialized training and experience. Even for administrative service, academic qualification in the relevant subject has been recommended by the Fulton Committee and relevant studies for 3 years in Ecole Nationale d'Administration is already a built-in feature of the French Civil Service. Indeed, administration of government, like management of business, is itself a specialized profession and all countries do need, at all stages of their development, a corps of professional administrators to discharge administrative tasks, as business requires professional managers to deal with business management.

The nature of this professional administration can also be specifically identified. Characteristically, the task of public administration consists in helping the formulation of policies and sub-policies in the light of goals and objectives indicated by the political executive, translation of these policies and sub-policies in terms of operational programmes, devising organizations for running these programmes, laying down methods and procedures of these organizations and actually handling these organizations in order to execute the programmes effectively. These are the tasks of administration and these are common to implementation of every type of programme—whether it is organizing of supplies for agriculture, establishing and running basic industrial projects, planning and programming infra-structure facilities or running institutions like hospitals and schools. Agricultural administration is different from agriculture and an agricultural scientist may not necessarily possess the skills of an agricultural administrator. It may be interesting to recollect here that the Committee on Co-operative

Administration headed by an eminent co-operator like the late Shri Vaikunthlal Mehta preferred an I.A.S. officer to a promoted departmental officer to hold the post of the Registrar of Co-operative Societies because it is the former who has the breadth of understanding and outlook which is necessary for the incumbent of the post of a Head of a Department. There the mere narrow functional experience of a departmental officer was considered to be inadequate.

Public Administration—A Speciality

A public administrator like the business manager is responsible for all the tasks of management like planning, organizing, staffing, directing, co-ordinating, controlling, reviewing, evaluating and innovating programmes of different kinds. The public administrator has, even more than a business manager, to have knowledge of the legal framework and the framework of government and the skill to work with the political executive and the constitutional machinery of government. Thus, the public administrator has to be a manager and something more. It is not enough for him to use men, money and material resources to the optimum extent or to take objective decisions. He has to combine them with team work of different kinds of persons, including political executives and scientists. It is hardly fair to dismiss these administrative tasks and the service responsible for the discharge of these tasks as mere 'generalist'. Administrators have to be specialists, in fact, in their own way. This specialism is of critical significance, specially in under-developed countries. In fact, even those like Shri Butani* who have tried to pooh pooh the generalist and to uphold the recommendations of the A.R.C., have identified "integrated co-ordination" as a hall-mark of an administrator.

The exercise of knowledge, skills and techniques required for the "integrated co-ordination" or more generally, for the administrative tasks described above, does require a special corps of professional administrators.

In terms of the tasks outlined above, this corps has to consist of persons of high intelligence, recruited on merit and given fairly diverse experience, at one end of administration in terms of policy formulation, and at the other end, in terms of programme implementation. The administrator also has to have experience of dealing with men and institutions in different sectors of administration. Indeed, skills of public administration like those of business management are built

*K. N. Butani, "Personnel Administration—A Muffled Cry for Change by the Administrative Reforms Commission", *The Indian Journal of Public Administration*, Vol. XV, No. 1 (January-March), 1969.

through a certain mobility of experience. In short, experience in depth in the whole spectrum from policy formulation to programme execution and experience in width in different areas of administration go to make a mature professional administrator. Just as management skills are transferable from one field of business to another so are the skills of public administration transferable from one department of public administration to another.

The scope for public administration would, of course, vary according to the ends of the State and the stage of development. During the British days, the scope of public administration was limited to land revenue collection, law and order and certain amount of infra-structure development. Consistent with this, the scope of public administration and the task for which the administrator was trained and in which he had experience, were also limited to the functions of revenue collection and law and order. Today, the scope of public administration is much broader, thanks to the successive plans, and the scope of public administration covers the entire gamut of economic development and social change. The professional administrators have, therefore, to be recruited and trained to perform the administrative tasks in a much vaster area of public administration.

To overlook this and to confine the scope of administrative services to the old functions of law and order and revenue collection is to ignore entirely administrative functions in the context of planned development, to conceive of them in purely static terms and to forget the dynamics of administration, and indeed, to overlook completely the lines on which the administrative service has developed in India after Independence.

Manning of Technical Posts

That does not mean that all posts in government, created in the wake of economic development and social change, will be occupied by the officers of the administrative services. Technical posts requiring technical qualifications, including the posts through which the technical programmes are implemented as well as posts meant for giving technical advice will all have to be manned by technicians and scientists. Like administrators, the technicians and scientists will also be functioning at different levels.

In the context of the widening and deepening of scope of public administration, it would be scarcely appropriate to treat the professional administrator, today, as an "unalloyed generalist", though that might have been a permissible use of the term when the scope of

administration was confined to revenue administration. But it must be pointed out that even the "unalloyed generalist" was assumed to have certain specific qualifications. First, he was recruited on the basis of merit as demonstrated by performance in examination in universities and in competitive selection examination in all subjects including the classical subjects. This was indicative of the mental ability and versatile intelligence capable of quickly grasping the essentials of different subjects and situations. Secondly, the generalist was also supposed to have the ability to sift and weigh the pros and cons of a problem or take a balanced view of different opinions and points of views of different specialists and to arrive at a decision in a practical situation which would be in the best interest of all concerned. These qualities of intelligence, quick mind, sense of judgment and balance, are important in the professional administrator even of today when the administration has become diversified and complicated and is linked up with the progress of science and technology. What is required is to re-inforce these qualities with many other additional qualifications. This would include specialized training in the scientific management which has developed into a speciality including the knowledge of management accounting and statistical techniques. The administrator also needs special training in the techniques and processes of planning. Moreover, the very diversification of administration would require that the administrator, after the general experience in area administration at the field level, should develop specialization in different areas in administration. This is the general basis of the recommendations of the Fulton Committee Report. But the A.R.C., while inspired by the principle of specialization enunciated by the Fulton Committee, has run counter to its application to the administrative service and has applied it in a manner which would lead to the euthanasia of the professional administrator himself! This would be disastrous to the development of public administration as an instrument of State policy.

Importance of Diversified Field Experience

It is in this context, that one would have to assess the role of the officers of the I.A.S. The recruits to that service, like those to the Indian Civil Service are recruited on merit. If this leads to a monopoly of merit, none should grudge it because it is in the interest of the country. In this context, to talk of a privilege and to treat these privileges as on par with those of the feudal landlords is a rank abuse of the term privilege. It is possible to attract the cream of the Indian youth to the I.A.S. only if it is a service of professional administrators providing a challenging career in various areas of public administration and at all levels from programme implementation to policy making. On

the other hand, to downgrade the I.A.S. to collection of revenue and maintenance of law and order is to throw away all possibilities of developing a corps of professional administrators in our country. Indeed, having failed to correctly understand the nature and scope of public administration in India today and the place of I.A.S. therein, the A.R.C. Report makes an uncalled for and somewhat quixotic effort to carve out a special functional area for the I.A.S. To reduce the I.A.S. to a service attending to the functions of land revenue collection, is to emasculate it. Such glorified *Tahsildar service* will not attract promising candidates.

Having regard to the diversification of administration, the officers in the I.A.S. will require, as recommended for the British Civil Service by the Fulton Committee Report, a more intensified programme of training as an integral part of a scientific career development programme. It is the latter which needs the greatest emphasis. After a general district experience, the officer of the I.A.S. will have his career in a specialized area of administration like agricultural, industrial, social or economic administration and special functions of administration like finance or personnel.

The secretariat is essentially an organization to advise the political executive on policy formulation. As indicated earlier, administration by definition covers the entire gamut from policy formulation to programme implementation. The tasks of policy formulation can never be divorced from those of programme implementation or else the policy will tend to be unrealistic; practical difficulties will not be taken into account in policy formulation. Those who are utterly innocent of the conditions in the field can only produce utopian schemes with no chance of success. This is particularly important in India where there is such a big gap between the conceptual sophistication of the intellectuals and the conditions and realities of the masses of people in rural India. A policy is not worth anything except in terms of its practical implementation. It is, therefore, of crucial importance that those responsible for advising on policies in the secretariat are persons with wide variety of administrative experience as District Divisional and State officers and officers in the State secretariats. The success of our planned programmes depends on a single line of understanding and communication from Delhi right up to the village. It is this which makes the field experience of I.A.S. officers of unique significance to the task of policy formulation.

This does not mean that the scientists and technicians will have no place in policy formulation. On all technical and scientific matters,

their advice would be the last word but on all administrative and organizational matters it is the professional administrator who can give the right advice.

The Central Services, like the Income Tax, Audit and Accounts or the Postal services, have not been treated as on par with the I.A.S. because they are purely Central Services and not all-India Services. The policy formulation in the Union Government is profoundly dependent on the relationship between the State and the Union and the officers of the Central Services without any experience of working in the State administration can hardly bring to bear on their tasks intimate understanding of State administration and of policy formulation in State Governments. Indeed, the Central Secretariat is that of *Union* Government and not of Central Government. Where, in the Union Government, policy formulation is purely in respect of Central administration, officers of the Audit and Accounts, Income Tax or Postal services may have their own role to play. But the mainstream of administration at the district level, the State level and the Central (Union) level, has inevitably to be the area of the professional administrator. It is to provide such a professional administration that the I.A.S. is constituted. Barring some peripheral areas, the posts in the Central Secretariat falling in the mainstream of administration, will have to be filled by the officers of the I.A.S. tested in the crucible of experience at the district, headquarters of a department and the State Secretariat.

Conclusions Without Investigation

It is because of the wrong premises and assumptions from which the A.R.C. has started that the structure and staffing of the positions in the Central Secretariat as envisaged by the A.R.C., has gone hay wire. Indeed, it is astonishing that it has recommended certain general classification for the non-functional posts without a detailed examination of the posts and the tasks in the several departments of the Central Secretariat. In other words, having indicated the general lines the Commission left the task of classification of posts in the Central Government to be done by another agency. Thus, their conclusions have preceded investigation! Had the Commission attempted a detailed and scientific job-classification, it would have seen how utterly inadequate and inappropriate its classification of non-functional posts really was.

The A.R.C. Report makes too much of examinations of all sorts including those for a selective entry to the posts of Deputy Secretaries which have been termed as middle management positions. Those who

are prepared to soft-pedal the performance of young recruits at the initial examination are, on the other hand, enthusiastic about the importance of the mid-term examinations, and treat all opposition to them as an attempt of the I.A.S. to claim a privilege or a special protection! The importance of the initial examination was emphasized long back by Macauley Report as also by the Northcote-Trevelyan Report. Young men, who intellectually excel their peers at the early stage in their career, would continue to do so in later life. There is no reason to question this expectation, by and large. On the other hand, modern personnel management practices do recognize scientific system of personnel appraisal as an integral part of career development. It is this, rather than periodic examinations, that should be the basis for the promotion and development of the career of an officer of the civil service. Unfortunately, to the subject of career development very little attention has been paid by the A.R.C. We have done little to plan the careers of our civil servants and yet the success of our planning is significantly tied up with the planning of the careers of the officers of the civil service. It is this rather than mid-career examinations which ought to receive the urgent attention of the reformers of personnel administration.

It is the faulty basis of the A.R.C.'s recommendations regarding the structure of and recruitment to the posts of Deputy Secretaries and Joint Secretaries in the Central Secretariat that has led the Commission to recommend the induction of officers with non-administrative experience at the middle management level in the Central Secretariat and consequently to provide for training of such persons in the rudiments of administration and management. Techniques and methods of management which ought to be imparted to an administrator at the beginning of his career and in whose application he ought to gather experience in the first few years of his service are sought to be imparted to him later in the career at the time of his induction in middle management level. It is, indeed, anomalous and in a way wasteful to provide foundation training at the middle management level.

The Question of a Rational Pay Structure

Just as the A.R.C. has adopted the Fulton principle of specialization but has distorted it in its application, so also it has picked up the principle of unified grading structure and applied it incorrectly. The Commission has attacked the existing multiplicity of scales for different groups of posts as an irrational system and has recommended the unified grading structure as a rational system. It has advocated "equal pay for equal work" as the rational basis for a unified grading structure.

But enunciating this principle in the abstract makes no meaning unless the work content of different posts is analysed. The A.R.C. no where makes such an attempt. It does not recognize that by the application of its own principle, multiplicity of work will logically result in multiplicity of grades. Nor does the Commission recognize the fact that the true rational basis of any pay structure or compensation system is to provide incentive to *persons* who are entrusted with jobs. Jobs cannot be considered in isolation from the men who would perform them. It is irrational to fix pay for jobs just because they are so described on paper. The pay is rather to be adjusted to the qualities and talents of the man who can do a job. There are hundred different ways of doing a job—good, bad and indifferent—and it is irrational not to take this into account. The principle of "equal pay for equal work" thus ultimately means or ought to mean "equal pay for equal talent and competence". It is only when this is recognized, that the grading structure does not remain, as it does in the A.R.C.'s Report, a static concept but gets dynamically linked up with the whole system of personnel administration including recruitment and career development calculated to select the best men and to draw out the best in them throughout their career. Of course, an objective measurement either of work or of men is by no means easy and the limitations in this regard have to be taken into account in devising the system of compensation.

A Pandora's Box of Personnel Reforms

The non-scientific distinction between functional and non-functional posts at the level of Under Secretary and Deputy Secretary has led the Commission to recommend a clumsy and complicated system of pools—of recruitment to, retention in and retirement from the pool. These recommendations will open up a veritable Pandora's box of evils. There will be constant jockeying for positions between functional pools and non-functional pools, the pool posts within a functional service and the non-pool posts in that functional service and hostility between different pools and between the service officers who are within the pool and who are left out. It is true that civil service is for government work and not *vice versa*. But civil service seething with discontent because of the pools in which it is divided would hardly provide a satisfactory instrument for the discharge of work which is entrusted to administration.

Indeed, while the A.R.C. Report started with a proper identification of the objective of the system of personnel administration, *viz.*, to make the civil service equal to the task of modern administration

and while the principle of specialization within administration is sound, irrationalities and even some eccentricities have led to the distorted application of this principle, throughout the Report. Employing only one member of the family and not both husband and wife, moral and didactic preaching in the training of administrators, special examinations for first-class graduates and the oracular pronouncements in fixed numerical terms (whose sanctity or rationality is not clear), like 9 grades for middle management, 25 grades for posts at all levels, 26 years of age as an upper limit for entry to competitive examination, 8 areas of specialisations, 35 years of age for late recruitment with 6 years of completed service—all these are some of the points of unintended curiosity in the report!

A.R.C. ON PERSONNEL ADMINISTRATION — A STUDY IN BIAS

Nilmadhab Mohanty

THE Report on Personnel Administration submitted by the Administrative Reforms Commission (A.R.C.) to the Government of India makes a number of recommendations for reorganizing the civil service in the country. Particularly, it contains what the Report calls 'an out-line for reform' for manning the higher policy and management posts in the Central Secretariat and the attached offices.

The A.R.C. rightly points out that the work of modern government has become more technical and complex due to the scientific and technological progress and increase in the positive activities of the State. There is, therefore, need for discarding the concept of 'unalloyed generalism' and making room for professionalism in the civil service. The suggestion that there should be proper job analysis of the civil service posts and that all higher policy and management posts in the Central Secretariat and attached offices should be filled up by professionally competent persons, is a rational one.

The A.R.C. seeks to promote professionalism in the higher civil service by dividing the work of government into what it calls the 'functional areas' and the 'non-functional areas' and by suggesting various procedures for staffing the higher policy and management posts in these areas. There should be a 'functional service' for each 'function' of Government and officers belonging to the various functional services will develop professionalism by occupying all posts (including the middle and senior management posts) in their respective functional areas. The posts outside the functional areas (called 'non-functional posts') have been divided into eight 'areas of the specialism'. The middle (Deputy Secretary and equivalent levels) and senior (Joint Secretary and above) policy and management posts in these areas of specialism are to be manned by officers from the various 'functional services' as well as from the non-functional services.

The use of words like 'function', 'functional service' and 'functional approach' lends a pseudo-scientific touch to the Commission's recommendations. But an examination of the proposals would show that

these recommendations suffer from a number of inadequacies, contradictions, lack of objective and detailed study which make the Report anything but scientific.

Lack of Definitions

To begin with, the Report does not contain any clear definition of the terms, 'function', 'functional service' and 'non-functional posts'. The farthest it goes when it says that:

> "Wherever numbers involved in a particular function are viable, we would recommend that such posts should be grouped into the regularly constituted services.
>
> "However, in forming such services—all-India or Central—the functional aspect should be fully borne in mind. There should be reservation of posts for a particular service only insofar as the qualifications, training and experience of its members make them specifically qualified to man the posts; but in respect of other posts, the eligibility should be shared in common with the members of other Services who may be expected equally well to fill these posts after some training and/or work experience, if necessary."[1]

There is no detailed study of the civil service work (at least of some representative blocks or areas) either by the Commission or its Study Teams to show that the tasks of the Central Government, particularly in the Secretariat, can be categorised into such 'functional' and 'non-functional' compartments. In fact, when the process of job analysis is entered into it may appear that most of the jobs in the Secretariat have the so-called 'functional' and 'non-functional' components and their allotment to different services or areas will be arbitrary.

There is also confusion regarding the eight 'non-functional areas of specialism' and 'functional areas' as the basis of this distinction has not been indicated. For instance, it is not understood as to how agricultural administration could be grouped under the 'non-functional area of specialism'. Besides, in the context of a specialised and complex administration every higher policy and management post in the Government will require professionalism and deep familiarity with the subject-matter of work. Therefore, the distinction between the 'functional areas' requiring 'specially' qualified persons and the 'non-functional areas' requiring persons with 'some training and/or work

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[1] Administrative Reforms Commission, *Report on Personnel Administration*, New Delhi, April, 1969.

experience, if necessary, appears arbitrary and unnecessary. In fact, the Study Team on 'Personnel Planning, Staffing of Public Sector Undertakings and Personnel Management' headed by Shri R. K. Patil had recommended that the work in the civil service should be categorized into eight areas of specialization and civil servants, irrespective of their service-origin, should specialize in these areas of professionalism. Similar conclusions were reached by the Deshmukh Study Team on 'Machinery of the Government of India and its Procedures of Work' and the Setalvad Study Team on 'Centre-State Relationships' although they differed on the details of these areas. In the U.K. also, the Fulton Committee has talked of the broad 'areas of Government' where administrators have to specialize in order to attain professionalism in their work.

Further confusion has been created by defining the term 'functional service' to include not only those 'services' which are charged with a technical function for which a pre-entry vocational education is required (*i.e.*, the various Engineering Services) but also those which specialize after entry in a particular area of administration (such as, Accounts, Income Tax) and for which no pre-entry vocational education other than a certain level of educational qualification is prescribed. The distinction between these two groups of personnel is a real one as they perform qualitatively different functions and avoidable confusion has been created by grouping them together.

Flexibility

The non-technical services like Accounts, Income Tax, Postal Service, etc., are unifunctional in nature. Like the 'departmental classes' of the U.K. (which also include Customs and Excise, Inland Revenue, etc.) they have been constituted to meet the requirement of specific skills and aptitudes for the kind of work their respective departments do. Thus, by definition, these non-technical, unifunctional services will lack the flexibility of operation and breadth of vision which is needed in the higher policy and management posts in the civil service, particularly in the Secretariat. A general (as against generalist) Civil Service, on the other hand, can remain flexible as its members often have experience of a variety of posts and there is a high degree of interchargeability which enables it to meet the demands of different administrations. The performance and achievements of the Civil Service in India after Independence and partition of the country is a pointer to this fact. In the U.K. also, the trend is against the formation of such departmental classes as "the flexibility of Civil Service, and its abilities to move quickly to meet the changing demands

of different administrations, would be seriously at risk if a pattern of Departmental Classes emerged on any more widespread scale than exists at present."[2] The Fulton Committee which, like the A.R.C., pleaded for professionalism amongst administrators also envisaged a general civil service whose members would specialize in different areas of administration. "At the same time", the Committee went on to say, "since modern administration requires men to have breadth as well as depth, and since civil servants operate in a political environment, it seems to us important that such specialization should not be narrowly conceived."[3]

One of the A.R.C.'s Study Teams (the Patil Study Team) had also examined this question and came to the following conclusions:

> "We also do not favour the other extreme suggestion of meeting the requirements of higher positions in the Secretariat by officers belonging to the corresponding departments only without any arrangements for building up a specific group of higher civil servants for the following reasons:
>
> (*i*) There is no one—one correspondence between executive departments and Secretariat Departments. There may be more than one department under the same ministry or an appreciable part of the area of activity of a secretariat department may not be concerned with any specific department; the secretariat department may be dealing with wider public policy which may concern the private sector or the citizen directly. In the Central Government, some secretariat departments may depend on State Governments for the execution of their policies; for these units which do not have an executive counterpart, personnel for higher levels will have to be specially built up;
>
> (*ii*) This scheme may have the effect of making the Central Government and State Governments separate water-tight administrative units without any organic link."[4]

In the main report, the A.R.C. has not given any reason as to why it differed from these conclusions. The Commission has gone in for a set of uni-functional services with the avowed object of

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[2] *The Civil Service, Evidence submitted to the Fulton Committee (1966-68)*, Vol. 5(1), London, H.M.S.O., 1968.

[3] *The Civil Service, Report of the (Fulton) Committee (1966-68)*, London, H.M.S.O., 1968.

[4] Administrative Reforms Commission, *Report of the Study Team on Personnel Planning, Staffing of Public Sector Undertakings and Personnel Management*, New Delhi, August 1967, Para 3.149, p. 88.

promoting professionalism amongst the civil servants although the needs of modern administration will be served better by the existence of a general civil service whose members are encouraged to specialize in different areas of government work by proper training and career development.

Inner Contradiction

Besides, in some ways the proposals of the A.R.C., if accepted, would encourage 'generalism' rather than curb it. Part of the 'generalism' of which the civil service in India is accused of, has been due to the fact that officers from various unifunctional central services are utilized in posts in the Central Secretariat and attached offices where their specializations are not relevant. This has been highlighted by the Patil Study Team of the A.R.C. when it said:

> " ... the requirements of professionalism and expertise have not been provided for; the induction of officers of specialist services has been more by virtue of their belonging to a Class I service and having a sort of claim to Secretariat positions rather than as a result of a purposive policy of determining their suitability of specific positions on the basis of their specialist experience in parent departments. Thus, a worse type of 'generalism' is developing where the only requirements to occupy a senior position are belonging to any Class I service and having put in a specific number of years; previous experience is being rendered completely irrelevant for secretariat postings....An officer with a background of Income-tax may be placed in the manpower branch and an audit service officer in agriculture."[5]

This was also supported by the Deshmukh Study Team when it said:

> " ...those who come from specialized cadres (*i.e.*, the Central services other than C.S.S.) become generalists when utilized in posts where their specializations are not relevant."[6]

The A.R.C.'s suggestion for providing officers from various 'functional services' for manning the posts in the non-functional areas of specialism will merely formalize and accentuate the process and continue the present reliance on generalism which the Report seeks to

[5] *Report of the Study Team on Personnel Planning, Staffing of Public Sector Undertakings and Personnel Management*, op. cit., para 3.127 (*iii*), p. 81.

[6] Administrative Reforms Commission, *Report of the Study Team on Machinery of the Government of India and its Procedures of Work*, New Delhi, February, 1968.

criticise. The Report suggests that these officers from the 'functional services' will be eligible for middle management posts in the Central Secretariat after eight years of service in their parent department. Considering the fact that they will have to undergo initial training after recruitment during this period, the time available for developing the necessary specialization is not adequate. Their secondment to the non-functional areas would mean that the functional expertise will not be developed fully in these offices. The examination which is proposed to be conducted for recruitment to middle management posts in 'non-functional areas' of specialism will be of a general nature and will mean repetition of a portion of the examination taken at the time of initial recruitment and can hardly test their professional competence. Although it is provided that at the time of final selection and allotment to different areas of specialism, the previous background of the officers would be taken into consideration, there is no certainty that the written examination will throw up officers from various 'functional services' having the background required for the areas of specialism where vacancies have occurred. Again, if after completing his tenure in the non-functional areas of specialism, an officer comes back to his parent cadre, he goes back to the 'functional area' with which he has no touch for a number of years and where his recently acquired specialization may not be of use. This will be generalism par excellence.

Thus, there is an inner contradiction in a system where a set of unifunctional non-technical services meant for doing the special work of their respective departments will provide the personnel for the higher policy and management posts in the Secretariat. The A.R.C. seems to have fallen victim to this contradiction due to the fact that it never undertook any scientific study of the various kinds of functions being discharged by the existing unifunctional, non-technical services (like Accounts, Income-tax, Postal, etc.) and members of a general civil service, like the Indian Administrative Service, in their respective cadre posts in order to establish their respective co-relations (or lack of it) with the work being done in the policy and management posts in the Secretariat. Although an exhaustive study was not possible (and is recommended to be done by the proposed Department of Personnel), a few representative samples could have been examined before the conclusions were formulated. Without doing any such objective study, the A.R.C. has merely proposed the continuance and creation of a set of unifunctional non-technical services and thereafter, has sought to endow these services with the characteristics and functions of a general civil service with the result that we may have the worst of both the worlds.

This is not to say that members of these unifunctional services will

not be eligible for top policy and management posts in the Government. Those among them who later on show aptitude and ability to take up higher management work should have an opportunity to man these posts and the personnel system must provide for this.

Specialists

The technical services (like Scientists, Engineers, Doctors, Economists, Statisticians, etc.), on the other hand, come under a different category. These are 'specialists' and they play a distinct role in the formulation of government policies and their implementation. The primary concern of these groups is the practice of their specialism and their role at the decision-making level is to speak with specialist experience and depth of knowledge of the scientific and technical merits of particular policies or course of action. Today, as Shri Shanker has pointed out in his dissenting note to the Report on Personnel Administration, the view point of the specialist is accorded due recognition in the decision-making at the highest levels. The administrator, on the other hand, cannot have the same depth of expertise as the specialist. His role consists in bringing together the disparate issues involved in taking major decisions of policy, advise (along with the specialist) on what the decisions should be, and subsequently to ensure that the decisions are implemented. He works in a political environment and has to prepare a great deal of explanatory information for the Minister, the Legislature, and the public. He prepares legislation and helps Ministers in its passage in the legislature. These are functions for which there are always deadlines and the civil servant has to attend to these on priority basis. Work of this kind should not be handled by specialists. This is not to say that specialists are unable to have full appreciation of the wider issues and discharge the other functions of the administrator. What is meant is that if a specialist becomes immersed in the day-to-day problems of administration, he ceases to be a specialist and will, in turn, need other specialists for giving expert advice which is needed in policy-making. The Fulton Report on Civil Service reforms in the U.K. emphasized this point and said:

> "Our aim is not to replace specialists by administrators, or *vice versa*. They should be complementary to one another. It is, rather, that the administrator trained and experienced in his subject matter should enjoy a more fruitful relationship with the specialist and that the service should harness the best contributions from each."[7]

[7] *The Civil Service, Report of the (Fulton) Committee*, op. cit.

Complementary Relationship

The A.R.C.'s Report unfortunately does not discuss this complementary nature of relationship between the specialist and the administrator in the higher policy-making levels. Instead, the technical and non-technical services have been projected as competitors for the middle and senior management posts in the Central Secretariat and attached offices. The A.R.C. has found all ills in Government due to the fact that members of the technical services have not occupied the higher policy advisory posts in the Secretariat. One is not sure if the A.R.C. had examined and compared the performance of the Ministries and organizations staffed mostly with the technical services (like the Ministry of Education, the Planning Commission, C.S.I.R., etc.) with that of the other Ministries where non-technical services predominate, it would have come to the conclusions it did.

This is not to say that all is well with the working relationship between the specialists in technical services and administrators in the country. Mostly, difficulties have arisen due to the lack of understanding of functions of one group by the other and due to an irrational scale of preference which places the Secretariat posts on a higher level than the field posts. Perhaps a detailed job analysis as suggested by the A.R.C. will set these posts in their proper perspective and will be able to minimize discrepancy in status and emoluments amongst the services. Their working relationships can be improved: (*i*) by widening the opportunity for persons with technical qualifications to join the general civil service (I.A.S.) at the time of recruitment, (*ii*) by allowing members of the technical services showing aptitude and abilities late in their career for administrative work to transfer themselves to the higher policy-management group, and (*iii*) by arranging for the administrators and technical officers to work in integrated heirarchies (on the basis of the right man for the right job) while retaining their separate grades.

Elite Service Concept

The most astonishing part of the A.R.C.'s Report, however, is the way it has treated the Indian Administrative Service. The I.A.S., like its predecessor the I.C.S., has a special role in the higher civil service scene and, whether one likes it or not, any analysis of the personnel administration of India must examine the concepts and considerations underlying the service. The Report does not contain any such detailed examination. It merely states that in the context of a specialized administration a 'general purpose' service like the Indian

Administrative Service having no such so-called 'functional' area of its own has no validity and acts as a hindrance to the development of specialized cadres. These conclusions have been arrived at without any detailed discussion about the considerations underlying the creation of the service and have been stated in a manner as if these are the last words on the subject. Not that the Commission did not have before it an analysis of the nature of the Indian Administrative Service. The A.R.C. Study Team headed by Shri R. K. Patil contained an exhaustive analysis of the considerations that have led to the creation of an elite service like the I.A.S. and had come to the conclusion that these considerations be applied with greater force in the present-day India. The Setalvad Study Team on Centre-State Relationships contained what it called a case study of the I.A.S. and discussed the considerations underlying the creation of the service objectively and in great length. Both these Reports while emphasising the need for professionalism in modern administration had come to the conclusion that by suitable policies of recruitment, training and deployment the service could and should be made to adapt itself to meet the changed requirements of a growing techno-economic society. Even the Deshmukh Study Team on 'Machinery of the Government of India and its Procedures of Work' had conceded that "the I.A.S. must remain the principal feeder source providing as it does the right kind of experience for senior management".[8] The A.R.C. has differed with all these without reasons, at least without indicating any. It is intriguing as to why it chose not to meet the arguments of its own Study Teams.

At this stage it is perhaps worthwhile to examine some of the considerations which have led to the creation of the service. The basic concept underlying the I.A.S. is talent and the service is meant to recruit personnel of high calibre to man the higher policy and management posts in the states and the Centre, thereby ensuring uniformity of standard at these two levels. In a developing society like ours the Government which has a positive role to play, must have its due share of the best available talent in the country. The existence of a service with clearly defined prospects of interesting and demanding work at a fairly early age and further increase in responsibility, for those who prove themselves, acts as a real incentive for attracting graduates of high calibre to the government service. This elitist concept is the very substance of the Indian Administrative Service, and any arrangement that disturbs this concept also demolishes the service. The A.R.C.'s recommendation for carving out a narrow 'functional' area has this effect and the Indian Administrative Service that remains thereafter

[8] *Report of the Study Team on Machinery of the Government of India and its Procedures of Work*, op. cit.

is not the Service which was created by Sardar Patel and lauded by Paul Appleby but something else. The more honest course for the Commission would have been to suggest the abolition of the I.A.S.

Criticism of the Concept

The criticism of the concept of 'elite service' has mainly proceeded on the following lines:

(*i*) It is a colonial concept and leads to inequality amongst various cadres and hegemony of one service;

(*ii*) Every function of Government has become important and talent should be equally distributed among all the services; and

(*iii*) The 'elite service' concept lays undue emphasis on the results of an examination taken at the time of recruitment and prevents qualified and able members of the other services from reaching the top position in the administration.

The first criticism has mostly come from other service-groups who are resentful of the role of the Indian Administrative Service. It is argued that an elite service (I.C.S.) mostly consisting of foreign rulers had validity in the pre-independent India but in the democratic set-up established after Independence all services should be treated alike and have the similar conditions of service. This argument stems from a mistaken understanding of the nature of an elite service. The importance of the group constituting the higher civil service lies in the fact that it sets the tone for the entire administration. It is, therefore, essential that personnel of high quality are attracted to this group. The elite service is a mechanism to recruit personnel of high calibre to man higher civil service posts. Thus, the condition of its existence is quality, not colonialism. The need for personnel of high calibre manning the top administrative and policy advisory posts has all along been recognized by the Indian society from ancient times and the I.C.S. merely reinforced this tradition. The I.A.S. was created by the leaders of Independent India and could not be called the handiwork of the colonial rulers. Besides, as the Patil Study Team has pointed out, the need for constituting a higher civil service has been recognized in most of the advanced countries in the world. The higher civil service in France, for example, is extremely elitist and by no stretch of imagination France can be called a colonial society.

Once the need for a talent-based elite service is accepted, democratic principles would mean equality of opportunity for all to compete for joining the service on the basis of proven merit. Thereafter the

arguments of democracy and egalitarianism should not be allowed to dilute the concept by bringing the elite service to a position of equality in terms of responsibilities and conditions of service with other services most of whose members had failed to make the grade. For this will act as a disincentive for persons of high calibre to join the civil service. It is for these reasons that the Setalvad Study Team had advised that the Government should "discourage resentful attitudes in other services, both State and Central. There is room in administration for all the different kinds of services and each should bend its entire energy in the performance of its allotted task rather than fritter away so much of it in bickering and recrimination".[9] This is not an argument in favour of the hegemony of one service or inferiority of the other, it is only a plea for giving greater responsibilities on the basis of proven merit and superiority of mind. It is unfortunate that the A.R.C. has failed to put this distinction in its proper perspective, thereby contributing to inter-service rivalries.

The second criticism to which the A.R.C. has lent support is based upon the erroneous assumption that personnel of high calibre are available in sufficient numbers for all the services to have their due share. Talent in any country is scarce and the Government has to compete with trade and industry—both in public and private sectors—for getting its share of high quality personnel. No Government can match the private sector in the matter of providing attractive emoluments and other conditions of service. This is more so in India where, over the years, the attractiveness of the higher civil service for the best available talent in the country has progressively decreased. The case study of the Indian Administrative Service undertaken by the Setalvad Study Team has shown that "although the number of first class graduates produced has increased, both absolutely and proportionately, the number of first class graduates appearing (in the competitive examination) has declined, both absolutely and proportionately (the decline in latter case being from 29 per cent to 8 per cent)".[10] Another study shows that while in 1959 every one out of 7.8 first class graduates appeared in the combined competitive examination for the Indian Administrative Service, etc., in 1967 the comparative figure was 1: 21.5 although the number of first class graduates coming out of the Universities and the number of vacancies had increased considerably. "It is not merely the fact of decline", says the Setalvad Study Team" that causes concern but its extent, illustrated more dramatically by a comparison of the figures for 1959 when for every vacancy in the

[9] Administrative Reforms Commission, *Report of the Study Team on Centre-State Relationships*, New Delhi, September, 1967.

[10] *Report of the Study Team on Centre-State Relationships*, op. cit.

Indian Administrative Service proper 11 first class graduates applied (as against an average of 14 in the period 1950-55) and for 1964, when this number came down to 3".[11] The Chairman of the U.P.S.C. in his oral evidence before the Second Pay Commission had also stated:

> "Our opinion on the experience of the combined results of the written examination and personality test is that about 80 to 90 top persons every year are suitable for I.A.S. and I.P.S. and about 200 or so would be suitable for Central Service. I would say that of them, about 40 to 50 candidates are really of good quality and stand out."

In this context, therefore, any arrangement that would seek to distribute talent amongst the services is bound to fail as in every such service the personnel of high calibre will be sadly outnumbered by mediocrity who would set the pace of administration. This will hardly be the proper condition for the best available talent in the country to join the higher civil services. Besides, it must be remembered that the mechanism of an elite service (with prospects of interesting and demanding work at a fairly young age and of further increases in responsibility for the deserving (entry into which signifies a recognition of merit at the all-India level, plays no mean part in attracting the best available talent in the country. To some extent, it offsets the effect of higher emoluments offered by the private sector. The acceptance of the A.R.C.'s recommendation of diluting the character of the I.A.S. would not result in proper distribution of talent but its diversion from the government service. At this stage, the civil service can not afford to further reduce its attraction to the most able university graduates. Instead, the quality of the I.A.S. should be rigidly controlled by netting talent from as many sources as available and by restricting entry to the most able. In this context, the suggestions of the Setalvad Study Team for restricting the appoinment of the I.A.S. personnel only to the top posts with distinct managerial and coordinating functions requiring the best quality and limiting annual recruitment to fifty persons, deserve consideration.

The third criticism has three main aspects. Firstly, it is contended that a substantial part of the country's talent gets diverted to technical institutions at the secondary level and is not available for recruitment to the higher civil service. This argument is easily conceded. The procedures for recruitment and the examination system should be reoriented to net talent from all possible sources including those with technical qualifications. As recommended by the Setalvad Study Team,

[11] *Report of the Study Team on Centre-State Relationship*, op. cit.

the scope of choice of optional subjects for the I.A.S. examination should be enlarged to include technical subjects (*e.g.*, engineering, medical sciences, accountancy, etc.).

Secondly, it is argued that the method of the competitive examination consisting of written test and interview is defective. This is not a criticism of the concept but that of the technique of the examination. This can be met by refining the system by the adoption of modern techniques of tests so that only the best available talent gets recruited into the service. It is, however, interesting to note that although the A.R.C. has not attached much importance to the competitive entry examination, it seeks to select officers for manning middle-management posts through yet another written examination (combined with interview) for Class I officers who have put in 8 to 12 years of service. This examination to be taken a few years after recruitment appears wholly redundant and can hardly serve the purpose of testing the professional competence of the candidates.

Thirdly, it is argued that undue emphasis is given on the results of an initial examination for recruitment. Not all of those selected for the elite service may prove suitable for the top posts in future and there may be some in other service-groups, particularly in the technical services, who may develop abilities and qualifications to man the higher policy and management posts in the government. There is some force in this argument but this should not be allowed to belittle the significance of the competitive examination in our socio-political context. Historically, the competitive entry examinations have been introduced as an answer to nepotism and political jobbery. The tradition of making appointments solely on merit assessed through a competitive examination conducted by an independent agency like the Public Service Commission, has taken deep roots in this country and this should not be disturbed. On the other hand, attempts in the past for forming 'administrative' and 'economic' pools through mid-career selection of officials have run into difficulties as these have come to be associated at least in public mind with privilege and patronage. In a country where forces of regionalism, casteism, and nepotism continue to raise their ugly heads, any whittling down of the significance of the competitive entry examinations can have serious consequences.

There is yet another reason as to why the competitive entry examination is important. The examination is open to candidates in the age group of 20-24 and it is at that level that the distribution of the best available talent between the private sector and the government

service takes place. In India, the civil service is a career service and there is not much mobility between the private sector and the government service due to the absence of a homogenous market for talent in various sectors. Therefore, the best available talent which goes into the private sector at the entry-level (20-24) is permanently lost to the civil service. It is, therefore, necessary to have a system of competitive examination which, at the level of initial recruitment, can net in talent from all available sources and which, by the opportunities and prestige it gives to the successful, is able to attract the graduates of the highest calibre.

This is not to say that all those selected for the I.A.S. through the initial examination would prove suitable for the top posts although the presumption is that with proper training and experience most of them would because of their quality. These personnel should provide 'the principal feeder source' for manning the senior management posts in the Central Secretariat and equivalent positions elsewhere. An element of selection and assessment should be introduced in mid-career (15-17 years) to ensure that only the deserving rise to fill the top posts (Joint Secretary and above) in the Central Secretariat. Similarly, some officers joining the technical services and unifunctional non-technical services late in their career may show abilities and talent for manning the top administrative posts and may wish to change over to the higher management group. The personnel system should give them widest opportunity to make this transfer.

'Generalism' and 'Professionalism'

Another concept which has long been associated with the I.A.S. in the philosophy of 'generalism'. According to this concept, the ideal administrator is seen as an intelligent layman moving frequently between various jobs, can take practical view of any problem in the light of his experience and knowledge of the government machinery. This philosophy has severe limitations as, in the modern context, deep familiarity with the subject-matter of one's work is equally important. This familiarity can come only through proper training and sustained experience. The A.R.C., however, seems to think that the principle of generalism is basic to the I.A.S. and, therefore, has sought to bring about a fundamental change in the nature of the service. A deeper examination would show that this is not so. 'Generalism' in the I.A.S. is the product of a particular manner in which the training and deployment of its members have been organized so long. Unlike the concept of talent, it is not the essence of the I.A.S. and can be changed to suit the requirements of the growing techno-economic society,

"Policies of recruitment, training and deployment may, therefore, have to be fashioned", said the Setalvad Study Team "to work out a gradual and continuous evolution of the character of the service so that it is able to adapt itself to changed requirements and yet remain itself, the stress on its different attributes changing according to the ethos of the era".[12] The Patil and Deshmukh Study Teams of the A.R.C. have also thought on similar lines and have recommended that the members of the I.A.S. should be allowed to develop professionalism in different broad areas of government work through suitable policies of training and career development.

It may be added here that professionalism expected of an administrator is different from the knowledge in depth which the specialist brings to bear on his work. Familiarity with the subject-matter of his work will enable the administrator to seek for specialist advice in the right quarters, understand the advice and process it for decision-making. It will improve his capacity to evaluate the government policies and programmes and initiate new lines of action.

Although subject-matter professionalism is important, the value of the specialized knowledge in public administration, which the members of the I.A.S. have, should not be minimized. They spend their careers at various levels of administration—district, state and Centre—and acquire a high degree of expertise in administrative processes and working of a complex machine of Government in a way not found in other service-groups. It is in this sense that they are 'professional' administrators—a role which the A.R.C. has failed to recognize. This professionalism in administration needs to be enriched by further 'professionalism' in subject-matter so that the I.A.S. can truly play its role as the 'principal feeder source' for the top policy posts in the higher civil service.

Another consideration which has led to the creation of the Indian Administrative Service is the need to have inter-change of experience between the Centre and the States. This is achieved through a system of deputation from the States to the Centre. The uniqueness of the 'district experience' has been emphasized by the champions of the I.A.S. and its utility for higher policy and management posts has been questioned by its critics. The relevance of the district experience of the I.A.S. officer cannot be considered in isolation; it has to be taken in conjunction with other experience-pattern in the States in order to find out the suitability of the members of the service to man the senior

[12] *Report of the Study Team on Centre-State Relationship*, op. cit.

management posts in the Central Government. The district experience (which includes experience in sub-divisions) brings the members of the service face to face with the rural masses, with "the human side all the time in a dynamic and moving society"; it gives them a unique opportunity of knowing the problems in the field where the effects of the policies of the government are felt. It involves them in the formulation and execution of local development schemes and helps in developing qualities of judgement, objectivity, and coordination, which are so essential in the higher policy and management posts in the States and the Centre. At the State level the experience-pattern covers many spheres of administration, like finance, planning, agriculture, industrial development, development of transport and communications, etc. Besides, they also operate in top policy-making advisory and executive positions and work in support of Ministers in a political environment. It is the totality of this experience which makes the I.A.S. officer uniquely suitable for the higher managerial posts in the Central Government.

There may not be much originality in the view-points expressed in the foregoing paragraphs as most of them are based on the arguments put forward by the A.R.C.'s own Study Teams referred to above. These Study Teams consisted of many prominent personalities and were professionally competent to pass judgement on the personnel system. By and large, they have based their conclusions on detailed study and analysis. The A.R.C.'s main Report has dispensed with these 'luxuries'. The result is that most of the recommendations are in the nature of dogmatic assertions, more like the private opinions of its members than the result of any objective study. And two of its members—Shri Shankar and Shri T. N. Singh—who have had wide experience of the working of the Central Government, have submitted their notes of dissent in respect of some of the basic recommendations, particularly those relating to the reorganization of the personnel system. It is, therefore, doubtful if the A.R.C.'s Report on Personnel Administration can provide any objective basis for the reform of the higher civil service. The Government may have to turn to the Reports of some of the Study Teams for necessary analysis and recommendations for further action.

An Alternative Proposal

There is need for change, and change there should be. The existing personnel system needs to be reformed to meet the requirements of a complex techno-economic society. On the basis of the principles and concepts discussed in the foregoing part of this article,

an alternative proposal for reform of the higher civil service is discussed below.

(1) There is need for a flexible, general (as against generalist) civil service to man the higher policy and management posts in the Central as well the State Governments, particularly in the Secretariat. The members of this service should be of high calibre and they should have experience in breadth and depth to meet the requirements of modern administration. The Indian Administrative Service has traditionally met this need and it should be reoriented so that its members can play an effective role in a complex administration.

There are a number of senior posts under the Central and State Governments which because of their technical, technological and/or scientific nature of work, require technical experts from various disciplines. These posts are manned by experts grouped into various Class I technical services (Central and All-India). They perform a very useful role in administration.

There are a number of Executive Departments (as distinguished from Secretariat Departments or Ministries), mostly in the Central Government, which require senior personnel having specialized skills for the kind of work their respective Departments do. Members of a number of unifunctional, non-technical Class I services man the senior posts in these executive Departments.

The personnel structure that exists in the country today needs to be reoriented to meet the requirements of modern administration.

(2) Recruitment to the Indian Administrative Service, the technical services as well as the unifunctional, non-technical services, should primarily be on the basis of open competitive examination. There should not be any common examination for recruitment to these categories of services as the purpose of recruitment in each case differs from that of the other. The present practice of having some sort of a common examination (in a few subjects) for recruitment to the Indian Administrative Service and non-technical services should be abolished and, instead, there should be different sets of examination for each of these categories.

(3) Quality is the essence of the I.A.S. and under no circumstances there should be any deviation from this principle. Recruitment to the I.A.S. at the entry level should be open to graduates of all qualifications (including technical qualifications) so that there is the widest opportunity for the best available talent in the country to compete for the service. The graduates should be put to toughest possible tests to ensure that only the best are selected for manning the higher policy and

management posts in the Government. The optional subjects in th I.A.S. examination should include all technical subjects so that graduat with technical qualifications do not suffer from any handicap *vis-a-v* graduates with qualifications in arts and pure sciences. Entry c graduates with different background and qualifications will give dive sity to the service. Direct recruitment to the I.A.S. should be limite to 50 persons every year so that there is no deterioration in the qualit of its members. In case of subsequent entries (lateral entry) into th I.A.S., there should not be any departure from the principle of meri The Setalvad Study Team in its "Report on Centre-State Relationship has suggested a number of measures for maintaining quality as envis ged in the original scheme of the I.A.S. These should be accepted an implemented immediately.

(4) The I.A.S. personnel should be employed in higher admini trative, managerial and coordinative posts in the State and Centr Governments. The State Cadres should consist of senior admini trative posts like those of Chief Secretary, Development Commissione other Commissioners (including Commissioners of Divisions), Men bers of Board of Revenue, Collectors, Secretaries to Governmen Deputy Secretaries of important Departments, and certain Heads c Departments. The I.A.S. should be recognized as the 'primary feed source' for middle and senior policy and management posts (Deput Secretary and above) in the Central Secretariat. It is, however, nece sary that for manning the posts of Joint Secretary and above in th Central Secretariat, an element of selection is introduced for selectin only those officers who have shown ability and talent for administrati and managerial work at the top-most levels. The method of selectio should be such as to ensure that only the deserving go to the to Similar procedure for selection should also be introduced for mannin the posts in the super-time scale of the I.A.S. in the States. This ma necessitate revision of rules governing retirement and pension so th those among the officers who are dissatisfied with the result of the sele tion can leave the service without much pecuniary loss and can see employment elsewhere.

The deputation-quota of various I.A.S. Cadres should be increase so that the Central Government is able to utilize the services of mo I.A.S. officers than at present. The tenure system should be continue so that there is interchange of experience between the States and th Centre although at the senior levels (Additional Secretaries and Secr taries to Government of India) there may be some modification of th principle on grounds of specialization.

(5) By adopting suitable policy of training and career develo ment, the Indian Administrative Service should be developed into

corps of competent, professional administrators. The members of this service acquire a high degree of expertise in administrative processes and the functioning of the complex machinery of the Government by working in various levels of the State and Central Governments. This expertise is essential for manning the higher policy and management posts in civil service. Their professionalism in the subject-matter of various areas of government work should also be developed by purposive training and career development. The Report of the A.R.C. as well as those of the Study Teams give an outline of various areas of Government work. These should be carefully examined and broad areas of administration should be identified. The members of the I.A.S. should be encouraged to specialize in these areas of work.

Until now the most important method of training has always been thought to be on the job and although this will always continue to be very important, there should be more of formal training at various stages in an officer's career. The training should aim at the development of the officer's skill in administrative and managerial techniques as well as in the knowledge of the subject with which he is concerned.

Career planning in the form of carefully thought-out postings is essential for the development of required professionalism in the members of the I.A.S. Postings should take due account of a person's background, training and aptitude as well as the need for widening of experience. Through planned movement between the posts in an area of administration or related fields (covering many Departments/Ministries) officers should be encouraged to specialize. An officer should be kept in an area of administration or related areas for the first 15 years of his career in order to enable him to acquire the required professionalism. During this period he should also be posted to the Sub-division (in junior scale) and the District (in senior scale) to have experience of administration at the 'grass-roots' level and develop qualities of judgement, objectivity and coordination. This is also necessary in the interest of widening of experience of the officer. Too short a period in one job prevents an officer from being effective in a particular field of government work. Longer tenure should be allowed for officers both at the State level and the Central level. As a rule, Secretaries to Government in the States and officers in the posts of Joint Secretary and above in the Centre should be kept in jobs for not less than 5 years. Similar terms should be worked out for other posts. The need for specialization should be kept in mind while deploying officers in the States as well as in the Central Government.

Thus, by intensive training and career planning, a group of

professional administrators will be available for the highest posts in the civil service.

(6) The Class I technical services (Central and All-India) consist of specialists like Engineers, Doctors, Scientists, Economists, etc. Their role is complementary to that of the administrators and they bring in the element of expert knowledge in decision-making. They also administer the technical departments in the country. Most of these officers would like to make their careers in their own fields and would reach the highest posts in the scientific and technical spheres. Some of them, however, may show aptitude and abilities, perhaps late in their career, for administrative and managerial work and they should have the widest opportunity to man the senior policy and management posts in the Government. These personnel should, however, be selected on the basis of their ability and talent for administrative work rather than by virtue of their being specialists. Their previous background should determine their suitability for specific senior management posts.

(7) The unifunctional, non-technical Class I Services, like Audit and Accounts, Income Tax, Customs and Excise, Postal, etc., have been constituted to meet the requirement of specific skills and aptitude for the kind of work their respective executive departments do. They will develop these skills in great depth and will normally reach the highest posts in their respective spheres. Some of them, however, may exhibit ability and skills for policy and management work in the Secretariat and they should have an opportunity for manning the higher policy and management posts in the government. Their suitability for specific secretariat posts should, however, be decided on the basis of their specialized experience and not for the reason of their being members of Class I Services as is being done at present.

Thus, in the personnel system that is envisaged, the I.A.S. should continue to be the 'principal feeder source' for the higher policy, management and administrative posts, both in the States and the Central Government. The quality of the personnel joining the I.A.S., their experience-pattern, the professionalism to be developed through coherent training and career planning and the qualities of judgement, objectivity and man-management acquired by working at different levels, would make them uniquely suitable for manning the top posts in government. The officers of the technical services as well as the unifunctional services will normally man top-most posts in their respective spheres. Some of them may perhaps late in their career show abilities and talent for administrative work. They should have widest

opportunity to man the senior policy and management posts in the Central Government and there should be flexibility in making appointments to these posts. The working relationships between the technical and non-technical services should also be improved by deploying the officers in integrated hierarchies on the basis of the best man for the job.

(8) A Central Personnel Agency should be created as suggested by the Administrative Reforms Commission and this Agency should undertake job analysis at various levels of public employment and examine the work being done by the members of various services. The remuneration-pattern for various posts can be established after such detailed job analysis. This will also help place the Secretariat posts as well as the posts in the executive departments in their proper perspective and correct the irrational scale of preference which brings in the concepts of superiority and inferiority in what is essentially a cooperative venture.

(9) In administration, members of various services have different roles to play and it is important to ensure that unnecessary service-rivalries are not allowed to vitiate the atmosphere in the civil service. The Central and the State Governments have a duty to see that there is no bickering among the services.

The proposals outlined above take into consideration the constitutional and administrative set-up, as well as the socio-political conditions existing in the country and seek to improve upon what has been built over the years so that the personnel system can meet the requirements of modern times.

PATERNALISM IN NEFA ADMINISTRATION

G. C. Singhvi

WHILE going through the scholarly article on "Paternalism in Indian Administration"[1] by Dr. Haridwar Rai, one feels that history apart, paternalism in administration characterized by the control of all departments of the administration in a district by one officer, the Deputy Commissioner (D.C.), and the maintenance of direct personal contact between him and his subordinates, on the one hand, and the tribal and other villagers, on the other, has a place of pride in the North East Frontier Agency (NEFA) even today. The guardianship orientation has been 'watered, nurtured and allowed to flower' in NEFA. It will, therefore, be worthwhile here to have a look at what is the constitutional status, geographical location and administrative set-up of NEFA. For, with that back-drop we shall better be able to appreciate the perspectives of the paternalist ideology to which happily NEFA stands committed.

The Back-drop

NEFA is constitutionally a part of Assam. It is bounded by Bhutan on the west, the Tibetan region and Sinkiang province of China in the north and north-east and by Burma in the east and south-east. Its international border is nearly 800 miles. NEFA covers an area of 31,438 square miles (81,426 square kilometres), and hardly any of it is flat. It is 'so mountainous, so cut about, chopped up and divided by countless streams, that on a month's tour you may well climb a total height exceeding that of Everest'. The annual rainfall averages to 180 centimetres.

NEFA consists of five districts, the names of which represent the names of the main rivers flowing through each of them. The names of districts and district headquarters are: Kameng (Hqrs. at Bomdila), Lohit (Hqrs. at Tezu), Subansiri (Hqrs. at Ziro), Siang (Hqrs. at Along), and Tirap (Hqrs. at Khonsa). It is inhabited by a number of tribes, and sub-tribes, totalling 82 and covering a population

[1] Dr. Haridwar Rai, "Paternalism in Indian Administration: The Non-Regulation System of Field Administration under the British", *Indian Journal of Public Administration*, Vol. XV, No. 2 (April-June), 1969.

of 2,99,944 out of a total of 3,36,558, according to 1961 census. Almost all the tribes have their own dialects.

NEFA is administered by the Union Government (Ministry of Home Affairs) with the Governor of Assam acting as Agent to the President of India under provisions of the Sixth Schedule (Table Part B) of the Constitution of India. The Governor is assisted by an Adviser. The Agency Secretariat has full fledged Planning and Development, General Administration, Home, Supply and Transport, Finance and Judicial wings and the offices of the heads of departments like Education, Medical and Health, Agriculture and Community Development, Engineering, Forests, Cooperatives, Industry, Publicity, Panchayats, Rehabilitation and Settlement. It is located at Shillong.

Each of the five districts of NEFA is under the charge of a Deputy Commissioner. There are five Sub-divisions which are in independent charge of an Additional Deputy Commissioner each. These are Tawang, Sepla, Daporijo, Pasighat and Anini. All these Deputy Commissioners (which term includes Additional Deputy Commissioners as well) are senior Indian Administrative Service/Indian Frontier Administrative Service officers. The other 10 Sub-divisions are in the charge of Assistant Commissioners (A.Cs.) or Extra Assistant Commissioners (E.A.Cs.) who belong to the NEFA Administrative Service while the 79 Circles are under the charge of Circle Officers (C.Os.).

The Administrative Officers act as "local heads for all subjects affecting their jurisdictions, such as development work, maintenance of law and order, revenue work, community development schemes, socio-cultural affairs of the people and the exercise of authority over the various installations and schemes of the various technical departments, such as Schools, Hospitals, Roads, Agriculture and so on".[2]

'Focal Person'

This underscores the point that, in the districts, the powers of direct superintendence and control over all governmental activities are centred in one authority, *i.e.*, the Deputy Commissioner—the 'focal person'. This position of primacy accorded to the single overall head of the district (and his subordinate administrative officers) "has come to be known as Single Chain Administration", (an action-motivated and achievement-centred variant of paternalist administration). Under this pattern the heads of all technical offices in the districts like the Inspector of Schools,

[2] Shri P. N. Luthra, "Tribal Customs in NEFA Administration", *Statesman: Independence Day Supplement*, August 14, 1969.

the Agricultural Officers, the Co-operatives Officer, the Industries Officer, the Medical Officer and so on, work directly under (and as an integral part of the office of) the Deputy Commissioner. Technically speaking, they are not heads of offices (drawing and disbursing officers). Even the ministerial staff posted in their offices is not under their disciplinary control. Thus, administratively and operationally the district departmental heads are under the overall control of the Deputy Commissioner.

Administration of Justice

The edifice of the administration of justice in NEFA stands on powerful pillars of a couple of proven principles. One is that 'the tribal communities need simple codes and laws' in the formulation of which 'the local customs and usages' need be given due importance. The other one is that the customary laws and indigenous institutions of the tribal people should be maintained intact while deciding judicial cases at the village or community level. Both these criteria are eminently fulfilled by the law governing the administration of justice in NEFA—the Assam Frontier (Administration of Justice) Regulation I of 1945. Its bare 59 sections admirably encompass the whole law relating to the police, civil and criminal proceedings and evidence. The salient features of this system are:

(1) Civil and criminal justice is administered by the D.Cs., A.Cs. and village authorities, 'all of whom are recognized as competent administrators of the law'. They are, however, to be guided by the principles and spirit (and not the letter) of the Codes of Civil and Criminal Procedure and the Indian Evidence Act.

(2) The D.Cs. and A.Cs. are appointed by the Governor. Members of village authorities are appointed by the D.Cs.

(3) Village authorities discharge ordinary duties of police, like keeping a watch and reporting on crimes and criminals, and apprehending suspects and criminals.

(4) Civil Police Stations, which luckily are conspicuous by their very absence in NEFA at the moment, are under the control of the D.Cs. Criminal cases are to be registered at the police stations, investigated and put up in the Courts by the investigating police officers only under the orders of the D.Cs. The supervisory police officers have only routine administration of police staff to be looked into by them.

(5) Civil and criminal jurisdictions have been defined. A. D. C.

may try suits of any value and may pass any sentence warranted by law. An A.C. may try suits not exceeding Rs. 1,000 in value and has powers of a First Class Magistrate. Village authorities can try certain types of suits in which both parties are indigenous to the Agency. On the criminal side, these authorities may try cases of thefts, mischiefs, simple hurts, etc., provided the accused persons are resident within their jurisdiction, and may award sentences of fine not exceeding Rs. 50 for any offence.

(6) Village authorities decide civil and criminal cases in open *Darbar* in the presence of at least three independent witnesses and both parties. Proceedings need not be recorded in writing. Similarly, statements recorded by D.Cs./A.Cs. need not be got signed by the parties concerned.

(7) D.Cs. and A;Cs. make endeavours to persuade parties to the civil suits to submit to arbitration.

(8) Appellate authorities have been prescribed. In certain circumstances appeals go to the Assam High Court. The High Court may entertain an appeal by special leave also. High Court and D.Cs. have powers of revision.

(9) Sentences of death, transportation and imprisonment for seven years or more are subject to confirmation by the High Court.

(10) The President and the Governor are vested with certain powers of suspension, remission and commutation of sentences.

(11) No pleaders can appear in any case before the village authorities. Pleaders may, however, be allowed to appear in the Courts of D.Cs./A.Cs. with the permission of D.Cs.

These courts, with their simplified procedures possess definite advantages for the poor classes of litigants. Their working is based on the paternalist principles that cases should be tried in the simplest, cheapest and the most expeditious manner. Thus, paternalism permeates administration of justice in NEFA.

The Panchayati Raj

Paternalism has found manifestation also in the Panchayati Raj which is being introduced in NEFA under the auspices of the North East Frontier Agency Panchayati Raj Regulation of 1967. This Regulation envisions a four-tier system of Panchayati Raj—the Gram

Panchayat at the base (village level), the Anchal Samiti at the block level, Zila Parishad at the district level and the Agency Council at the apex (the NEFA Administration level). The Gram Panchayat shall be the village authority as defined by the Assam Frontier (Administration of Justice) Regulation of 1945. Its members shall be appointed by the D.C. "The idea of 'electing' people is not yet familiar"[3] to the people of NEFA. Nevertheless, the other three tiers shall consist of elected bodies—the base, of course, being the Gram Panchayat. The S.D.O. (Additional D.C., A.C. or E.A.C.) shall be the President of the Anchal Samiti; the D.C. of the Zila Parishad; and the Governor of the Agency Council. The emerging pattern of paternalist Panchayati Raj would very well fit in, the well established and well set Single Chain Administration.

Single Chain Administration Weakened ?

In short, it is evident that what has come to be known as Single Chain Administration is conceptually a variant of paternalist administration and that there would be a perceptible change for the better if it is transformed structurally *also* into a Single Chain. At the moment, admittedly, there is a little lack of fusion in the links of the chain because of the induction, at the Agency level, of the heads of technical departments who function under the subordination of the NEFA Administration but who, understandably though, have no superordination, over the D.Cs. to whom the district heads of technical departments are subordinate. The entire gamut of relationships assumes a new complexion because the heads of technical departments at the Agency level are also vested with some sort of control over district officers of their departments. The ensuing duality of control over the district heads of technical departments weakens and loosens the departmental chain of command to the detriment of role-playing in the developmental drama, comprising programming and execution of developmental activities. Moreover, this induction undeniably amounts to introduction of multiplicity of authorities which tends to perplex the simple minded tribals. "We should not over-administer these areas or overwhelm them with a multiplicity of schemes."[4] Tailoring technical appointments to suit the administrative needs is, therefore, inescapable. In order to conform to the norms of the ethos of the paternalist administration, the posts of highly paid heads of departments should willy-nilly be replaced by moderately paid technical advisers to the Administration in Medical, Education, Agriculture, Industries, Engineering, Forest, and similar other Departments.

[3] Verrier Elwin, *Democracy in NEFA*, Shillong, North East Frontier Agency, 1965.

[4] Jawaharlal Nehru, Foreword to the second edition of *A Philosophy for NEFA* by Verrier Elwin, Shillong, North East Frontier Agency, 1958.

An Integrated Set-up

The resultant hierarchical structure imparting a new meaning, a new rationality, in terms of functional considerations of public administration would be somewhat like this. At the apex there would be the Adviser to the Governor, and below him would be Secretaries-cum-Heads of Departments for specific activities or group of activities. Technical Advisers would be attached to them as part of the Secretariat (as Deputy Secretaries or the like) but they would not have any control over the district technical officers. Below the Secretary-cum-Head of a Department would be the D.C. who could, for each department be an *ex officio* joint head of that department in his own district. Under him, would be the district heads of technical departments. This 'level-jumping' would be more rational, logical and paternal, and would help in stimulating participative role-playing. In the interest of economy, efficiency, propriety and decorum, the technical advisers to the Administration and the district heads of technical departments should be placed in a pay scale not higher than the senior scale of pay of the I.A.S. and the scale of pay admissible to the A.Cs. or E.A.Cs. belonging to the NEFA Administrative Service, respectively.

Conclusion

In conclusion, it may be added that, as Raikes points out, "the paternalist Single Chain Administration of NEFA which euphemistically speaking is 'a half-way house between despotic personal rule and the Government by impersonal rule of law' and which is characterized by 'the union of all powers, executive, magisterial and judicial in the hands of the Deputy Commissioner'—the 'paternalist of the benevolent type', the 'kindly autocrat', and in a word 'a kind of terrestrial providence'. This pattern of administration is so simple, so powerful, so entirely adapted to the genius of the people that it must, like truth, prevail and sooner or later extend over the entire peninsula. However much philosophers may sneer, a 'paternal despotism' is not only the happiest but the only regime for India.'

DELEGATION OF FINANCIAL POWERS

M. J. K. Thavaraj & K. L. Handa

WITH the progressive involvement of the Government in developmental activities and the increasing specialization of its functions, the nature of decisions taken has undergone a basic change and, at the same time, the points at which their implementation rests have become numerous. Such an unprecedented expansion in the scope and content of governmental activities within the framework of a highly centralized administrative structure has often led to inordinate delays and inefficiency in the implementation of the developmental programmes. Consequently, several attempts have been made since Independence to bring about a close correspondence between authority and responsibility at the various levels of administration. Of the whole gamut of delegations, those pertaining to financial powers are of crucial importance as their nature and extent would have intimate bearing on most of the administrative actions.

The need for delegation of financial powers was recognized years ago in the reports of Sir James Grigg (1934-39) and Sir Richard Tottenham (November 1945). The problem assumed added significance after Independence. It attracted increasing attention in the different administrative reforms enquiries commissioned by the Government, *e.g.*, reports of N. Gopalaswami Ayyangar (1949), A.D. Gorwala (1951), Paul H. Appleby (1953), etc. The Estimates Committee in its Ninth Report (1953-54) stressed the need for delegation of financial powers to meet the requirements of the changed circumstances. As a result of the growing awareness of the problem both within and outside the government, greater financial powers were delegated in 1953 in respect of creation of posts and contingent expenditure. These powers were further enhanced in 1954 and again in 1955. A real break-through, however, came in 1958 when the Government of India sought to delegate enhanced financial powers based on the recommendations of Shri A. K. Chanda.[1] Another scheme of

[1] Shri A. K. Chanda, the then Comptroller & Auditor General of India, undertook the task of preparing a comprehensive plan for delegation of financial powers and for a reorganization of the system of financial control and included his plan as an appendix to the Audit Report of 1955. He recommended that to avoid delays in the issue of

delegation was worked out in 1961 which, on an experimental basis, devolved enhanced financial responsibilities on the Ministries of Commerce and Industry, Community Development, Panchayati Raj and Cooperation, Information and Broadcasting, and the Department of Food. This scheme envisaged exercise of control by the Ministry of Finance mainly through pre-budget scrutiny and through random checks and work studies. The scheme was extended to other ministries and departments of the Government of India from June 1, 1962.

Soon after the introduction the scope of this scheme had to be restricted under the impact of the Chinese aggression. The Government order of 30th September, 1964, required all proposals for new construction or for release of funds to be sanctioned in consultation with the Ministry of Finance. Another Government order, of 19th August, 1965, placed a ban on the creation of fresh posts not required for Plan schemes or security purposes. The position was, however, reviewed towards the end of 1965. Consequently, the bans imposed earlier were lifted on March 15, 1966 and the Scheme of Delegation brought into operation as it obtained in June 1962.

Of late, the Administrative Reforms Commission[2] has been seized of the question of delegation of financial powers. Its Study Teams on Financial Administration and on Machinery of the Government of India and its Procedures of Work[3] have devoted considerable attention to this problem. The Administrative Reforms Commission has submitted to the Government of India a special report entitled "Delegation of Financial and Administrative Powers"[4] incorporating its views on the subject.

The Delegation Scheme of June 1962 was reviewed in 1967 by the administrative ministries at the request of the Finance Secretary, and

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expenditure sanctions, the particulars of the proposal referred by the administrative ministry to the Ministry of Finance at the pre-budget review stage should be furnished in greater detail to enable the Finance Ministry to carry out a better and more systematic pre-budget scrutiny and that the administrative ministries might be empowered to issue expenditure sanctions of schemes included in the budget and the cost of which did not exceed Rs. 50 lakhs.

[2] Administrative Reforms Commission, *Report of the Study Team on Financial Administration*, New Delhi, May 1967 pp. 49-67.

[3] Administrative Reforms Commission, *Report of the Study Team on Machinery of the Government of India and its Procedures of Work*, Part II (Vol. I), February 1968, Ch. VII.

[4] Administrative Reforms Commission, *Report on Delegation of Financial and Administrative Powers*, New Delhi, June 1969. This report contains the views and recommendations of the Administrative Reforms Commission on the suggestions made in their reports by the Study Team on Machinery of the Government of India and its Procedures of Work (February 1968) and by the Working Group constituted by the Commission to report on Financial Rules (December 1968).

in the light of this review a modified scheme was evolved by the Ministry of Finance, delegating larger financial powers to the administrative ministries. The new scheme, which was introduced from October 1968 is also based on the arrangements that the Ministry of Finance wil exercise its control mainly by a proper scrutiny of the schemes proposals, etc., before inclusion in the budget and through an adequate system of reporting and test checks.

EXPENDITURE SANCTIONS

The statutory provisions under the Constitution assign to the Ministry of Finance a special position in regard to the management o financial affairs of Government. Such a pre-eminence of Finance i meant to ensure orderly allocations of limited resources between the competing demands. Traditionally, the Ministry of Finance exercised its control over public expenditure by scrutinising the various proposal of the spending departments before inclusion in the budget estimate and by according expenditure sanctions before the expenditure could be actually incurred.

The main objective of the various delegation schemes has been to improve the procedures for pre-budget scrutiny and delegate power of post-budget expenditure sanctions to the administrative department within broad limits. Under the Delegation Scheme of August 1958 the administrative ministries were authorized, subject to certain conditions, to issue expenditure sanctions on any scheme the total expenditur of which did not exceed Rs. 50 lakhs. These powers were enhanced under the Delegation Scheme of June 1962, which provided that any amounts, without specified limits, could be sanctioned by the administrative ministries if the projects for which such amounts were sanctioned had been earlier scrutinized and accepted by the Ministry of Finance The present position in this regard, therefore, is that administrative ministries have full powers to sanction expenditure on schemes or projects, provided funds are available and the scheme or the project, a a whole, has been scrutinized and accepted by the Ministry o Finance.

On the face of it, these powers of expenditure sanction vested in the administrative ministries are large enough to provide them with the necessary operational facility. But the actual position seems to be somewhat different. It has been observed that in a good many case it is not found feasible to complete the examination and scrutiny o schemes at the pre-budget stage. The Ministry of Finance maintain that the administrative ministries do not send their schemes in time

with all the necessary details. Lump sum provisions in the budget have, therefore, been found necessary. Consequently, the powers of expenditure sanction delegated to the spending Departments cannot be exercised. On the other hand, the administrative ministries complain that the Ministry of Finance keeps asking too many and sometimes unnecessary details rather than examining the proposals in the broader perspective.

Pre-budget scrutiny of expenditure proposals by the Ministry of Finance is a well-accepted principle and is necessary to be treated with all seriousness to serve best the interest of effective financial control. Such a scrutiny is also an important pre-requisite for a meaningful operation of any scheme of delegation of financial powers. It should, therefore, be the prime concern of both the administrative ministries and the Ministry of Finance to make efforts to see that such a scrutiny is completed before the expenditure proposals are incorporated in the budget. Whereas the administrative ministries would need gearing up of their organizations to be able to submit their expenditure proposals in time and complete in all significant aspects to enable the Ministry of Finance to carry out the necessary pre-budget scrutiny, the Ministry of Finance would also need to restrict such a scrutiny to the important details of the proposals asking for such relevant information in regard thereto as the administrative ministries could be reasonably expected to procure and supply within the stipulated period.

It is well-recognized that the administrative authority responsible for executing a major scheme has to take a number of steps before such a scheme is worked out to the last detail. Under conditions of uncertainty such estimates are subject to some variations. In fact, providing for such contingencies is an important aspect of delegation plans. This being so, excessive concern for details by the Ministry of Finance would disqualify even the most carefully worked out schemes at the stage of pre-budget scrutiny thereby negating the very spirit of delegations. The latest Delegation Scheme of October 1968 states that "the preparation of budget proposals in sufficient detail and their proper pre-budget scrutiny by the Finance Ministry is an essential feature of the scheme". It is, however, left vague as to what precisely is meant by "sufficient details" supporting an expenditure proposal for a "proper pre-budget scrutiny" by the Ministry of Finance. The realization of the intentions and purposes of the Delegation Scheme would, therefore, very much depend on the attitudes of the two sides and the good faith in which the Delegation Scheme is operated.

If the administrative ministries work out the schemes and projects

in all significant details having important financial bearing and th Ministry of Finance carries out pre-budget scrutiny in a constructiv purposeful and imaginative manner, asking for only essential details i broad terms, there is no reason why the Delegation Scheme, insofa as the powers of expenditure sanction are concerned, should not wor well. It would help matters if a sort of check list is drawn up by th Ministry of Finance in consultation with the administrative ministri of the broad details which it would consider essential for its examina tion of the proposals before they are incorporated in the budget. Thes broad details may relate only to the essential features of the schem giving reasonably accurate estimates of cost to enable the Finance Mini try to determine its feasibility and suitability for sanction. The r maining details may be left to be worked out by the administrati ministries from time to time with the help of their internal financ

Under the Delegation Scheme of October 1968, the powers expenditure sanction will not be available to the administrative mini tries in cases of Plan or non-Plan schemes for which lump sum prov sions are made in the budget until full details and justification of th schemes have been furnished to the Ministry of Finance and accepte by them. The A.R.C. Study Team on Financial Administration ha made the following observations on this problem:

> "It is a well accepted principle of budgeting that no provisio should be made for a scheme unless adequate details, togeth with a breakdown of cost, have been furnished to the Treasu and accepted by it. In other words, lump sum provision *i.e.*, provisions of which the details have not been worked out an therefore, are not available, should not ordinarily be include in the budget".[5]

Though the principle of not resorting to lump sum provisions i the budget estimates is unexceptionable, such a recourse may be u avoidable in certain unanticipated situations. There may arise a emergency situation necessitating urgent measures and a lum sum provision of funds therefor. It may also become necessary t provide for preliminary expenses on survey, etc., in connection with projected scheme; an itemwise and detailed breakdown of expens may be difficult to work out in such cases. There is also another typ of situation. Due to certain policies of the government or due to som sudden decisions at the higher levels about absorbing foreign aid c providing funds for some Plan schemes, a lump sum provision i

[5] Administrative Reforms Commission, *Report of the Study Team on Financi Administration*, New Delhi, May 1967, para 9.1, p. 38.

"imposed on" the administrative ministry and it is asked to go through the various formalities with the Ministry of Finance for getting the same included in the budget estimates.[6] Obviously, the administrative ministry would have little knowledge about the schemes to be covered by such a lump sum provision, much less their details. Of course, these are exceptional situations which could, when they arise, stand in the way of the exercise of delegated powers by the spending departments.

If, on the other hand, a lump sum provision results from the inability of the administrative ministries to adhere to the time schedule for budget making inasmuch as they are not ready with the necessary details of the scheme, such lapses in detailed planning on the part of the departments would render Schemes of Delegations meaningless and inoperative. All possible measures need to be taken to curb such a tendency of the administrative ministries. They should be pressed to work out their budget proposals, supported by all the necessary details, by the scheduled dates stipulated in the budget calendar so as to obtain the clearance of the Ministry of Finance well before the final date fixed for the purpose. In those cases, however, where funds are required to meet preliminary expenses on survey, etc., of a scheme and it is not possible to work out all the details, a small amount may be provided in the budget for the purpose. It needs hardly any emphasis that the Scheme of Delegation would work the best if lump sum provisions are avoided in the budget; and in most cases this would require advance planning of their operations on the part of the administrative ministries as part of their exercise of the formulation of budget proposals.

POWERS OF RE-APPROPRIATION

Under the Delegation Scheme of August 1958, the administrative ministries were delegated powers to re-appropriate funds in all matters except in the following cases which required concurrence of the Ministry of Finance: (*a*) reappropriation to augment the provision under the primary units relating to 'Pay of Officers' and 'Pay of Establishment' either for a scheme or for other types of expenditure; (*b*) reappropriation between the primary units under which provision is made for a scheme, involving an increase in the provision under any one such unit by more than 5 per cent or by more than Rs. 1 lakh, whichever is less; or (*c*) reappropriation from the provision made for a scheme to meet expenditure on any other purpose. The Delegation Scheme of June 1962 empowered the administrative ministries to reappropriate funds

[6] Some such cases came to light during the course of another study by the authors.

between primary units under which provision was made for groups of allied schemes, subject to the grouping of such allied schemes being specified with the previous consent of the Ministry of Finance. Grouping of provisions for Plan items with other items was not permissible, and reappropriation of funds from Plan items in order to meet non-Plan expenditure required the concurrence of the Finance Ministry.

Under the latest Delegation Scheme of October 1968, the administrative ministries have been given full powers of reappropriation within a grant, provided there is no diversion of funds intended for Plan schemes to non-Plan activities and there is no augmentation of the total provision made for administrative expenses (*i.e.*, pay, allowances, and other charges) under a particular grant.

The adequacy or otherwise of the existing powers of reappropriation delegated to the administrative ministries can be gauged better if we consider the whole problem in the light of the actual operation of these powers as between the administrative ministries and the Ministry of Finance.

A study of this aspect made by us for the Administrative Reforms Commission in March 1967, revealed that the administrative ministries, in actual practice, enjoyed enough freedom in the matter of reappropriation of funds, even in those cases where reappropriation of funds could, under the rules, be done only with the prior sanction of the Ministry of Finance. The only thing the administrative ministries need ensure is that savings are available under certain sub-heads of the Grant.[7] In the cases where the administrative ministries are in a position to locate savings under certain sub-heads of a grant, there seems to be an implicit feeling in them that the Ministry of Finance would put its seal of approval on a reappropriation proposal to divert funds from such a saving to meet an excess expenditure under some other sub-head of the same grant, and the whole process is looked upon by them as one of procedural interest only. The necessary concurrence of the Ministry of Finance is never doubted in such cases. It may also

[7] It may be stated here that the reasons for excess in expenditure, generally, are: (*i*) enhancement in the rates of emoluments of the employees during the course of the financial year, which could not be foreseen at the time of framing the budget estimates; (*ii*) abnormal rise in market prices; (*iii*) meeting expenditure on items not anticipated, including expenditure for equipment and machinery ordered in the previous year; (*iv*) extension of schemes and activities and consequent incurring of expenditure not provided for in the initial budget estimates, etc. Savings become possible for various reasons, namely, (*a*) non-filling or late filling of vacant posts and non-creation of additional new posts; (*b*) non-execution of stipulated task; (*c*) less receipt of equipment; (*d*) postponement of construction of works; (*e*) postponement of purchases of stores; (*f*) late or non-arrival of experts from abroad; (*g*) termination of schemes earlier than provided for in the budget, etc.

be stated that the timing of transmission of most of the reappropriation proposals by the administrative ministries to the Ministry of Finance for approval is such as would not allow a reasonable opportunity to the Ministry of Finance to examine such proposals with any degree of thoroughness. The majority of such cases are submitted to the Ministry of Finance in the later half of March when in most cases the excess expenditure has already been incurred or committed by the operating agency, and the Ministry of Finance has to deal with a case which is a '*fait accompli*', leaving it with no choice except to acquiesce in what has already been done.

Also, the Ministry of Finance is required to dispose of all the reappropriation cases before 31st March of that particular financial year as no reappropriation order issued after that date is accepted as valid by audit authorities. Therefore, during the few days which the Ministry of Finance gets to dispose of a good lot of reappropriation cases, its examination of such proposals cannot but be carried out in a hurried and casual manner and finalized at lower official levels. We may state here that out of all the 142 reappropriation orders pertaining to the various grants of an administrative department, sanctioned during 1965-66 and examined by us, 82 were issued on or after 15th March, 1966. Similarly, in the case of another administrative department all the three reappropriation orders pertaining to a grant were issued after the 15th March, 1966. The same was true of another department where all the 8 reappropriation orders pertaining to a grant were issued after 15th March, 1966. The study also revealed that the Ministry of Finance hardly had sufficient time to examine with any degree of thoroughness reappropriation cases submitted by the administrative ministries; and since the deadline of 31st March is to be adhered to, the ministry of Finance puts its seal of approval hurriedly on such cases. It would, therefore, seem that the control exercised by the Ministry of Finance in the cases of reappropriation of funds is more nominal than real.

The report of the above study, which was completed by us in March 1967, proposed that the administrative ministries should be vested with full powers to reappropriate funds within a grant, subject to certain conditions. It is gratifying that the Ministry of Finance have, vide their Orders of October 1968, delegated to the administrative ministries full powers of reappropriation within a grant. But, as mentioned earlier, these powers are subject to the condition that there is no diversion of funds intended for Plan schemes to non-Plan activities and there is no augmentation of the total provision made for administrative expenses (*i.e.*, pay, allowances, and other charges) under a particular grant.

In view of the actual operation of reappropriation powers, as outlined earlier, it is not understood how it would serve the interests of financial control if the administrative ministries are prohibited from reappropriating funds from Plan schemes to non-plan activities even if such a reappropriation is from one development scheme to another developmental purpose. It is rather a superfluous exercise of getting a proposal for reappropriation of funds from Plan to non-plan schemes approved by the Ministry of Finance, as for all practical proposes, the Ministry of Finance endorses the decisions already made by the administrative Ministries. Moreover, it is difficult to appreciate as to why a distinction should be made between Plan and non-Plan items in the matter of reappropriation of funds and not between development and non-development items of expenditure. Once some funds have been invested in a particular year in building an asset under the Plan, the expenditure on the operation and maintenance of this asset in the ensuing years is not treated as Plan expenditure though its relevance for development cannot be questioned. It is, therefore, suggested that the administrative ministries may be delegated powers to reappropriate funds from Plan schemes to non-Plan activities so long as the latter are developmental in character.

A better procedure for financial control would be that when an administrative ministry resorts to reappropriation from one item of expenditure to another and the amount involved exceeds a specified limit, it must seek the prior concurrence of the Ministry of Finance. If the specified limit is fixed at a reasonably high level, the number of reappropriation cases coming to the Ministry of Finance would be reduced, enabling it to examine such cases with a fair degree of thoroughness. It should, however, be ensured that such proposals reach the Ministry of Finance well before the close of the financial year so as to allow it sufficient time to carry out a proper examination of the reappropriation proposals.

For cases where full powers of reappropriation vest in the administrative ministries, it may be considered that the decision-taking should be at senior levels, say, Deputy Secretary and above depending upon the amount involved in the reappropriation proposal. Such a system would ensure a more responsible exercise of reappropriation powers by the administrative ministries than what obtains at present when these decisions are taken at junior official levels. It may also be considered that the Demands for Grants are recast to comprise of allied and related items of expenditure only so that the intentions of Parliament in voting a Demand are not defeated afterwards by reappropriation of funds between entirely unrelated items of expenditure.

Again, as we have seen earlier, the Delegation Scheme of October 1968 makes the exercise of powers of reappropriation by the administrative ministries subject to the condition that there is no augmentation of the total provision made for administrative expenses (*i.e.*, pay, allowances, and other charges) under a particular grant. We do not find much of a logic in putting such a restriction on the exercise of powers of reappropriation. We are of the view that the delegation of various other financial powers to the administrative ministries would be rendered considerably ineffective if the administrative ministries are denied powers to create posts even though such a course results in augmenting the total provision made for administrative expenses.

Incidentally, we may refer here to the suggestion made by the Study Team on Financial Administration[8] that there should be a greater overall control on the power of the administrative ministries to create posts. It has recommended that the proposals of the administrative ministries for additional staff or creation of posts should be considered by an independent and a well-trained Staff Inspection Unit and the administrative ministries should be precluded from augmenting the provisions under the 'Pay of Officers' and 'Pay of Establishment' by recourse to reappropriation. It has further stated that in the event of a sudden increase in work or work of an emergent nature devolving on a ministry they should continue to have powers to create posts of purely temporary nature for periods not exceeding three months if funds could be found by valid reappropriation within their budget provision. The Administrative Reforms Commission has expressed its agreement with the above suggestion of the Study Team on Financial Administration.[9]

We, however, find it difficult to agree with the views on the subject of either the Study Team on Financial Administration or the Administrative Reforms Commission. How do we provide an administrative ministry with the necessary operational freedom in the discharge of its functions by vesting it with powers to reappropriate funds within a grant from one primary unit under which a saving has occurred to finance another project requiring additional expenditure if the need for this excess expenditure turns out to be no more than appointing a few additional personnel for successfully executing the project? We would, therefore, urge that the restriction contained in the Delegation Scheme of October 1968 that there should be no augmentation, as a consequence

[8] Administrative Reforms Commission, *Report of the Study Team on Financial Administration*, New Delhi, May 1967, pp. 53-55.

[9] *Cf.* Administrative Reforms Commission, *Report on Finance Accounts and Audit*, New Delhi, January 1968, pp. 30-31.

of reappropriation of funds, of the total provision made for administrative expenses under a particular grant, is out of tune with the rest of the provisions of the scheme and is also not in consonance with the spirit in which other financial powers delegated are supposed to be exercised.[10] When financial powers are delegated to the administrative authorities to facilitate their functioning and to make for efficiency and speed in the implementation of the programmes, it is also necessary that these authorities are vested with adequate powers of creating posts needed in the execution of their tasks. Therefore, to enable the administrative ministries to make a meaningful use of the financial powers delegated to them they should be vested with full powers to create temporary posts, for even longer durations, by reappropriation of funds within a grant. Such powers should, however, be for the creation of temporary posts only, and in the event of these posts being made permanent the prior sanction of the Ministry of Finance should be essential. It is but reasonable that when an administrative authority proposes to bind the public exchequer with a long-term commitment by creating a permanent post, the Ministry of Finance should have final say in the matter and its prior approval should be necessary. Even where the powers are delegated for the creation of temporary posts only, it is imperative to ensure that such powers are exercised by the administrative authorities diligently and with due care of the established norms and standards. It may be added here that this is an area where much restraint and discipline has to be exercised in the use of financial powers so as to avoid adverse criticism from various quarters in the event of any increase in expenditure on staff. It needs hardly any emphasis that work standards should exist in the various organizations and that new posts should be created after a thorough study of the work load data.

Though the vesting of powers in the administrative ministries

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[10] We may quote here the views of another Study Team of the A. R. C. "At present, administrative ministries can create posts upto those of Joint Secretary's rank under their own powers subject to certain specified restrictions. We do not go along with the view of a sister study team that these powers should be curtailed on the ground that "there is considerable over-staffing in Government Departments" and that intra-ministry work study units have not built up the expertise required. We consider that delegations in regard to creation of posts cannot be looked at separately from the totality of financial delegations. The fundamental objective of delegating financial powers to administrative ministries is to make them as fully responsible and effective operationally as possible. It would be a contradictory and retrograde measure to make extensive delegations in their favour in other fields and to pull back in this matter of posts. If there is a fear that these powers may be misutilised, the answer should lie in the direction of building up arrangements for good financial management within ministries and a system of test checks from the Ministry of Finance rather than in the direction of recentralisation." Administrative Reforms Commission, *Report of the Study Team on "Machinery of the Government of India and its Procedures of Work"*, Part II (Vol. I), New Delhi, February 1968, pp. 47-148.

for the creation of temporary posts when needed is not disputed, it is suggested that the exercise of such powers should be subject to a thorough examination later by an independent Staff Inspection Unit staffed by trained personnel well-versed in the techniques of work study, work measurement, etc. Such a course would ensure that the administrative authorities exercise their powers of creation of posts according to the accepted principles and with due regard to the canons of efficiency and economy.

ADEQUACY OF EXISTING DELEGATIONS

It would seem that the Ministry of Finance has been receptive to the demands for greater delegations to the administrative ministries and has been issuing orders from time to time to give effect to its various schemes for delegation of enhanced financial powers. It is, however, difficult to give a straight answer as to whether the powers delegated so far are adequate enough to meet the present needs of the administrative ministries. The nature and extent of the financial powers delegated by the ministry of Finance to the administrative ministries would not alone provide an answer to this. The pattern of redelegations from the administrative ministries to the Heads of Departments and from them to the lower echelons and field agencies is also an important factor to be considered in judging the adequacy of existing delegations. Also, the needs for delegations would vary in the case of different organizations depending on their respective programme requirements and on whether they are to exercise such powers in normal times or in times of crisis and strain.

The Delegation Scheme of June 1962 exhorted the administrative Ministries to re-delegate, in their turn, administrative and financial powers to Heads of Departments and to other subordinate authorities, with due regard to their respective levels of responsibilities. It is well recognized that for a system of delegations to be effective, the powers delegated should seep down the line and be commensurate with the responsibilities to be discharged at the various official levels. The delegated powers should vary according to the nature and quantum of work to be performed by the delegatees. Though there are a few organizations, such as the Central Public Works Department, Scientific Laboratories, etc., in which cases special financial delegations have been made, by and large, in our delegation pattern, a sort of uniformity exists inasmuch as the same type of powers are delegated to all the administrative ministries, to all the Heads of Department and to the Heads of Office.

It is not understood how the needs for financial powers of all the

administrative ministries and Departments would be the same? How would similar powers delegated to all types of Heads of Departments would meet their respective needs. Also, the different types of Heads of Office would require different delegations for successfully discharging their functions. The Ministry of Finance should, therefore, evolve more than one delegation pattern to meet the requirements of the various categories of administrative ministries and Departments, of various types of Heads of Departments and Heads of Office, in accordance with their functional variegation. Not only that, the Finance Ministry should undertake a periodical review of such delegation patterns and effect modifications to suit the changed circumstances.[11]

The Heads of Department are, at present, not authorized to redelegate any of their powers to their subordinates. They can, however, do so with the prior consent of the administrative ministry. It has been observed that the administrative ministries are generally willing to accord approval to proposals for redelegation submitted by the Heads of Department. But the procedure of going through the formality of obtaining the concurrence of the administrative ministry is cumbersome and time consuming. It is, therefore, suggested that the powers delegated to the Heads of Department may be classified into two categories, firstly, those of a minor nature for which full powers may be vested in the Head of Department for redelegation to his subordinates according to his discretion; and secondly, powers of an important nature which can be redelegated by the Head of Department only after seeking the prior consent of the administrative ministry. Such a course would provide greater operational freedom to the Head of Department in making adjustments and readjustments in the redelegation of powers to his subordinates according to the needs of different programmes and changing circumstances.

Matching of adequate powers with the responsibilities at different official levels is not enough. It is of utmost importance that the delegatees exercise the powers so delegated in the discharge of their responsibilities and for the realization of the goals and objectives of their organizations. No scheme of Delegation, howsoever well framed, would work satisfactorily unless there is a 'will' on the part of delegatees to exercise the powers and on the part of the delegator to encourage the use of the delegated powers in the spirit in which they are intended. Again, the willingness of the delegatee to use his powers would very much depend on the prevailing environment and climate in which he has to function.

[11] The A. R. C. Study Team on Machinery of the Government of India and its Procedures of Work has echoed a similar line of argument in their Chapter "Delegations", (Chapter VII, Part II, Vol. I).

There are a number of inhibiting factors to the exercise of delegated powers, which we have observed during the course of our other studies. Sometimes the powers delegated are hedged by various conditions which the delegatee has to satisfy before exercising such powers. For instance, the Heads of Departments are empowered, under the rules, to write off a loss up to Rs. 1,000 provided: (*i*) it is not due to any serious negligence on the part of any government servant, (*ii*) it does not disclose a defect in rules or procedures the amendment of which requires the orders of higher authority or Finance Ministry, etc. In such cases where the powers delegated can be exercised only after satisfying a number of conditions, the tendency on the part of the delegatees is to push cases to the higher authorities for obtaining their concurrence. The delegatees do not feel sure of having satisfied the various conditions attached.

Fear of audit objections drives them to play it safe. Such fears manifest themselves in the form of frequent references to higher authorities in doubtful cases which often undermines the very spirit and purpose of delegations. The psychology of 'fear of audit' and 'public criticism' is responsible for sapping the initiative of the officers. Decisions of the administrators are often probed long after the event and when the context in which such decisions were taken has completely changed. Often they get demoralized when their individual acts of discretion are questioned. Sometimes audit objections are raised on petty and small matters and the concerned officer has to explain the lapse years after event when he might have been transferred to another organization and become completely out of touch with his previous work. To aviod landing into such like situations, the officers shy away from the exercise of discretion and prefer not to use the powers delegated to them. They try to involve as many authorities and agencies as possible in the decision-making process. Thus, the fear of being judged unfairly later for any lapse, major or minor, or for any error of judgement, acts as a big restraining influence on the officers in the matter of using their powers and taking decisions.

There may also be interference or pressure from above which make it difficult for a delegatee to exercise his powers. Verbal instructions from the higher bosses and directives given in high-level meetings may hold back the officers from exercising their delegated powers. At times, enhanced powers are delegated to the officers without their being properly equipped for the exercise of such powers. It is, therefore, obvious that adequate preparations ought to be made before launching a delegation plan and the delegatees should be provided with all the encouragement and support necessary for the exercise of such powers.

Another important factor responsible for discouraging the officers from using their powers is the multiplicity of rules and regulations which are changed so often that the officers generally do not feel confident of knowing all the relevant rules while exercising their powers. In their eagerness to avoid mistakes they are prompted to consult higher authorities and seek their concurrence.

It is suggested that if the scheme of delegations is to be meaningfully operated, the exercise of powers by the delegatees should be insisted upon. The Ministry of Finance should send back a case without expressing its views if the matter fell within the delegated powers of an administrative ministry. The same way the administrative ministries and Heads of Departments should insist upon the decisions being taken at levels vested with adeqaute powers. When references are made to them despite specific delegations, senior officers should return such cases to the subordinate officials without expressing their views thereby compelling the subordinates to take decisions falling within their ambit of authority and responsibility. Efforts towards 'neck preservation' at lower levels should be discouraged in practice. However, in the event of a genuine mistake committed in good faith, the subordinate official should be given proper and adequate protection. The exercise of powers by the delegatee, who has used his best judgement with due care, should be shown all sympathy and consideration by the higher authorities. There is an urgent need to remove from the minds of the officers the fear that they are likely to be judged unfairly if individual acts of judgement and discretion come to be questioned later. "A system of delegation will work effectively only if it is based on a trust of those working 'on-the-sopt'. Trust begets trust. A system which is based on a nagging distrust of those exercising powers will be destructive of initiative, the exercise of which is essential on a large scale in this era of development."[12]

It may facilitate exercise of delegated powers if up-to-date manuals are prepared containing the various financial rules and regulations which an officer would need to know in his day-to-day functioning. Functions should be clearly demarcated for each officer and he be supplied with an up-to-date booklet of powers enjoyed by him as well as by other officers he has to deal with.

PERFORMANCE BUDGETING

The Government of India have accepted the recommendations of

[12] Administrative Reforms Commission, *Report on "Delegation of Financial and Administrative Powers"*, New Delhi, June 1969, p. (i) para 4.

the Administrative Reforms Commission in regard to the introduction of Performance Budgeting in the Departments and organizations which are in charge of developmental programmes. The Government have followed it up with the preparation of alternate presentations of the budgets of some selected Ministries and Departments on a performance basis.[13] This, however, is an initial step towards the installation of performance budgeting as a tool of management of developmental programmes. Such a budget would specify physical targets, to be accomplished according to a time-schedule. Besides, it would indicate the volume of work to be taken up by the functionaries at various levels, who are responsible and accountable for their performance in achieving the targets.

In this scheme of budgeting, patterns of delegation would assume added significance as means of accomplishing the physical goals of the organizations. In this context, apart from a proper matching of authority and responsibility at various operational levels of performance, adequate attention should also be paid to create the right type of climate and other environments necessary to motivate the delegatees to exercise their powers for the effective performance of the tasks assigned to them.

Performance Budgeting also envisages suitable review of performance at various levels of operation. Such a review and control is largely based on meaningful reporting systems geared to managerial decisions. In this context, it may be worthwhile examining the role of the audit as an agency for evaluating the performance of various agencies. The Administrative Reforms Commission in their Report on "Finance, Accounts and Audit" have emphasized that the Comptroller and Auditor General should undertake propriety-cum-efficiency audit to cover all developmental activities of Government. As has been observed earlier, if the decisions of the administrators taken in their best judgement are probed much after the event and out of context of the circumstances then existing, it is bound to lead to irritations and heart

[13] Performance Budgets were prepared for the year 1968-69 in respect of four Ministries and some organizations under them. For the year 1969-70, the Government prepared performance budgets for the following Ministries/Departments :

(1) Ministry of Irrigation and Power;

(2) Department of Food;

(3) Department of Communications; (*a*) Posts & Telegraphs Department, (*b*) Overseas Communications Service, (*c*) The Monitoring Organization, (*d*) Wireless Planning & Coordination Wing;

(4) Ministry of Health, Family Planning, Works, Housing & Urban Development: (*a*) Department of Health, (*b*) Department of Family Planning, (*c*) Central Public Works Department, (*d*) Chief Controller of Printing & Stationery;

(5) Ministry of Shipping & Transport; and

(6) Ministry of Tourism & Civil Aviation: (*a*) Department of Civil Aviation, and (*b*) India Meteorological Department.

burning among the officers and would leave a demoralising effect on them. Efficiency audit by an outside authority would give a handle to the audit agency to question individual acts of discretion and the soundness of an officer's judgement. Such a development is bound to vitiate the climate for the exercise of delegated powers by the functionaries. The officers under such a situation would prefer to play safe and avoid taking decisions and responsibility. In our view, efficiency audit by an external agency would be a serious inhibiting factor to the exercise of powers by the delegatees resulting in delays, inefficiency and uneconomic execution of the projects.

We could also look at the problem from another angle. The present audit authority as it is constituted, conducts audit, by and large, with the assistance of auditors who belong to lower clerical cadres. It is true that other subordinate officers namely, Accountants (non-gazetted) and Assistant Accounts Officers (Class II Gazetted), supervise the work of the audit teams which are further placed under the charge of a Deputy Accountant General. But the fact remains that the bulk of such work is done by the functionaries at the lowest rung, namely, Auditors. The question, therefore arises as to whether such a body of officials would be competent to conduct efficiency audit of other organizations ? Will it not seriously vitiate the climate for the exercise of delegated powers by the officers when they know that their judgements and actions would be commented upon later by these junior officers from the Comptroller and Auditor General's organization ? A comment on the efficiency of another officer would evoke respect only when the Auditor is of an equivalent or higher rank than the officer whose work he comments upon. Also, such an auditor should have built up a reputation about his knowledge of the specialized area in which he conducts efficiency audit.

In view of the present shortage of trained manpower of the specific type, a further question arises as to whether it would be possible for the Comptroller and Auditor General to raise a large contingent of senior officers, divided into teams of specialists, for conducting efficiency audit in the various specialized fields to cover all developmental activities of the Government? If attempted, will the cost of such a measure be not prohibitive? We are, therefore, of the view that the work of efficiency audit should not be assigned to an outside authority like the Comptroller and Auditor General's organization.

This is, however, not denying the importance of the regularity-cum-propriety audit which this organization is already conducting and which should continue to remain its responsibility. But, the task

of efficiency audit should be an internal function carried out by an agency under the charge of the chief executive of the organization who is ultimately responsible and accountable for the achievement of results in terms of the objectives and targets laid out for his organization. The chief executive would be in a better position to gear such an agency to the needs of his organization, keeping in view the various considerations and maintaining the necessary climate for the proper exercise of delegated powers and shouldering of responsibility. Higher authorities like the administrative ministry and the Cabinet would also be there to sit in judgement on the overall efficiency of an organization.

DELEGATIONS AND FINANCIAL ADVISER

With the enhancement of powers of the administrative ministries over larger areas of responsibilities, the availability of expert advice to them on diverse and sometimes complex financial matters is of utmost importance. The need for developing cost consciousness within the spending Departments and agencies has been emphasized in all the delegation schemes. The institution of Financial Advisers in various forms have been suggested from time to time for this purpose. Accordingly, the Delegation Scheme of October 1968 emphasises that competent financial advice should be available internally to the administrative ministries. It gives the administrative ministries full powers to appoint Internal Financial Advisers of their choice and provides that the Internal Financial Adviser should be consulted in all cases before the exercise of delegated powers although it is open to the administrative Secretary to overrule his advice by an order in writing. According to the scheme, the administrative ministries should indicate in the sanctions issued by them in the exercise of their delegated powers that they have been issued after consultation with the internal Financial Adviser. The Scheme of October 1968 also permits the grouping of Ministries/Departments to be served, in certain circumstances, by a common Internal Financial Adviser.

In view of the complex and extended responsibilities which have devolved on the administrative Ministries and its officers in the wake of plans of economic development, the expertise of a financial adviser in matters pertaining to Finance should prove of great help in solving many a problem arising in the day-to-day working of the Ministry. It is, however, not understood as to why the Scheme of Delegations (October 1968) should treat an Internal Financial Adviser as differently from any other Joint Secretary in the administrative Ministry. The role of the Financial Adviser is to advise and assist the administrative Secretary in financial matters as is done by the other Joint Secretaries

in other matters. It should be left to the administrative Secretary, who is ultimately to assume full responsibility for a decision taken, to utilise the services of and take work from the Financial Adviser in whatever way he considers best. How much use is made of the presence of a Financial Adviser in the Ministry should be left to be decided ultimately by the personal equation which comes to be established between the administrative Secretary and the Financial Adviser and the amount of confidence which the former developes in the latter. The administrative Secretary need not be under any compulsion to consult the Financial Adviser in all cases of the exercise of delegated powers. If he has strong reasons to do otherwise, he may have freedom to by-pass the Financial Adviser and take the decision all by himself. It is enough that he assumes full responsibility for his actions and is accountable for the results. We may add here that the nature of expertise of the Financial Adviser being such, the administrative Secretary would be very much inclined to consult him in all matters having financial bearing. However, we are not in favour of providing any restrictions in the Delegation Scheme whereby an administrative Secretary is bound to consult the Financial Adviser while exercising the delegated powers and he has to record in writing his reasons for over-ruling the Financial Adviser in any particular case.

We are of the opinion that too rigid walls should not be erected around the Financial Adviser and the function of financial advice. The endeavour should be to train each of the officers as his own financial adviser so as to become adequately equipped to dispose of a good many cases of financial implications where he feels confident about his knowledge of rules and is prepared to take full responsibility. It is only to deal with difficult and complicated financial matters that a cadre of Finance Officers headed by the Financial Adviser carved out of the existing administrative hierarchy should exist to render expert advice when called upon. Such a cadre should remain an integral part of the administrative hierarchy in the organization and be completely under the head of the administrative Department. Some common functions like managing the budget and accounts work of the organization may also be put under the charge of these officers. However, the main responsibility for effective financial control should be that of the executive officers functioning at various levels. Such a course would considerably reduce the work load of the staff of the organization of the Financial Adviser and leave them with enough time to attend to those important and complex financial matters which the executive officers cannot dispose of by themselves. The administrative Secretary should have the discretion to assign this work of financial advice to any of his senior subordinates (a Joint Secretary) in whose competence

he has confidence. This senior officer rendering financial advice would form an integral part of the administrative ministry, functioning completely under the administrative Secretary and assisting him in the same way as any other Joint Secretary in the same Ministry.

If the position of a Financial Adviser is made similar to that of any other Joint Secretary in the administrative Ministry, it may not be possible to appoint one Financial Adviser to work for a group of Ministries/Departments as is envisaged in the Delegation Scheme of October 1968. However, if the work-load in an administrative Ministry pertaining to financial advice does not justify having a whole-time functionary for the job, the administrative Secretary should have powers to assign to the Financial Adviser any additional duties relating to other work of the Ministry. There need not be any fears entertained about this suggested arrangement so far as the role of the Financial Adviser is concerned and as regards the quality of financial advice to be tendered by him. The administrative Secretary, the Financial Adviser, the Joint Secretaries and other officers in the hierarchy are all limbs of the same government machinery and are supposed to consider matters in a purely objective and unbiased manner with due regard to the policies and decisions of government and to give honest and impartial advice to the authorities above them. There is no reason why a particular limb, namely, the Financial adviser should not function objectively and discharge his duties effectively as is expected of any other officer in the organization. The fact of the Financial Adviser being placed completely under the control of the administrative Secretary should not deter him from giving his independent and honest advice on financial matters as it is not supposed to happen in the case of any other conscientious Joint Secretary working under the same administrative Secretary. Also, it should not give rise to any misconceptions about the position and role of the administrative Secretary as he must remain fully responsible for the efficient and economical administration of the programmes entrusted to him and be accountable for the results.

PROFESSIONALISM IN CIVIL SERVICE

B. K. Dey

PROFESSIONALISM has of late become a fashionable term, almost a byword, in the parlance of public personnel administration. In the raging debate of the day, the slogan among the public services seems now to be 'professionalise or perish'. This has been heightened by the Prime Minister's recent pronouncement about 'committed bureaucracy'. The initial fog having now been dispelled, it has become abundantly clear that what the Prime Minister is advocating[1] represents almost the highest that the public services should seek to achieve, and interpreted correctly, it should really lead to one very distinct and distinguished acquisition for the civil services, that is, professionalism which alone can inject satisfying element into the services and bring about better policy formulation, more effective programme implementation, and all round community contentment.

Nature of Professionalism

The term 'professionalism' implies the existence, in good measure, of certain essential attributes connected with a profession. A profession has been defined in the Oxford English Dictionary, as "a vocation in which a professed knowledge of some department of learning or science is used in its application to the affairs of others or in the practice of an art founded upon". It is not merely a collection of individuals who eke out a living for themselves by the same kind of work; it essentially refers to a body of men who carry on their work in accordance with the rules (or recognized conventions) designed (or followed) to enforce certain standards for the superior performance of their duties and responsibilities, for greater service to the public, and for a more effective protection of the rights and interest of their membership group. A 'professional' would be distinguished from an ordinary 'laity'[2] by a more positive correlation between the acquisition of certain learning, and its applied excellence in the performance of his assigned functions within the frame of some accepted code of conduct geared to promote

[1] *The National Herald*, New Delhi, dated 6.9.1970.

[2] "All professions are conspiracies against the laity", George Bernard Shaw, quoted in "The Fulton Report: The Role of the Professional", by W. G. Harris, *Public Administration*, (London), Spring 1969, Vol. 47.

ultimate public good. It fact, in spite of his specific pre-entry knowledge-base pertaining to concepts, techniques or other skills germane to his functional field, a professional has continuously to explore, even in his post-employment career, the (new) unknowns of his earlier knowledge and re-equip himself constantly for better and perfected performance.[3]

It is possible to list certain traits which are basic to, and characteristic of, a professional group of public officials. They are:

(*i*) an organized body of knowledge and its various disciplines which is available to its members;

(*ii*) establishment of norms of competence for not merely initial entrance but also subsequent elevation in the service and consistent effort to secure general acceptance of these standards;

(*iii*) the need for development of such basic skills through training opportunities for the existing and prospective members of the profession;

(*iv*) a well-developed sense of dignity and worth as also the professional prestige attaching to the appropriate segment of public service;

(*v*) a code of ethical conduct, violation of which by any member will serve to debar him from the profession; and

(*vi*) an effective organization for the promotion of these objectives.

It would indeed be impossible to compile a complete catalogue of criteria[4] whose existence or absence would categorically decide any group's inclusion into, or exclusion from, the province of professionalism. These illustrative yet important traitist 'differentia' help, nevertheless, in identifying with relative facility the professional groupings and

[3] Fulton defines 'professionalism' as including two main attributes, "one is being skilled in one's job—skill which comes from training and sustained experience. The other is having the fundamental knowledge of and deep familiarity with a subject that enables a man to move with ease among its concepts. Both spring from and reinforce a constant striving for higher standards". *The Civil Service, Report of the Committee 1966-68*, Vol I, London H. M.'s Stationery Office.

Please see B. K. Dey, "Fulton Report—Some Comments", *Indian Journal of Public Administration*, Vol XIV, No. 4 (Oct.-Dec.) 1968 for an operational critique of Fultons concept of professionalism.

[4] York Willbern, "Professionlisation in the public services. Too Little or Too Much?" in Claude E. Hawley and Ruth G. Weintraub (Eds.) *Administrative Questions and Political Answers*, Princeton (N.J.) D Van Nostrand Co. Inc., 1966.

in distinguishing them from the purely 'technical'.[5] Over the years, there had been rocketing membership of different professional groups and services. Old professions are branching off into new ones and are becoming differentiated. Completely new professional areas have also been carved out—partly through splintering off from established ones and partly as a result of syntheses of older skill-groups. Those, which were earlier classed as "skilled trade", are now getting promotion (through later sophistications in theory and application) into "professional grade". Experience of the past, analysis of the present, and forecast of the future seem to suggest that the embryo of professionalism making perhaps its first small sprouting in the courtyard of 'guild' of the earlier centuries, has now grown into a 'great banyan', firmly rooted in the field of public personnel administration.

Professionalist Take-over

The inevitability of impending professionalist take-over from what is lay and amateurish in administration comes in sharp relief when we focus our attention of the changing pattern of tasks and functions of the present-day administration and make a projective assessment of the nature and style of administration in the seventies or perhaps the eighties. There is, in this diagnosis, the implied assumption that public services of yesterday, their structure, procedure, personnel, etc.—are going to be generally inadequate, and will, in reality, be thrown out of gear, to cope with the administrative imperatives of tomorrow. Indeed, meeting the future challenge squarely enough will be an impossible exercise for '*status quoistic*' services with only traditional or conventional skills available with them; it would surely need a new commitment, a pervasive and permeative ethos, and sharper tools and equipment.

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[5] To understand the real import of professional grouping, it may be apposite to quote here from the definitions of 'professional engineers' and of 'technicians', agreed to by the European and United States Engineering Committee and accepted by Britain's Council of Engineering Institutions:

> "*A Professional Engineer* is competent by virtue of his fundamental education and training to apply the scientific method of outlook to the analysis and solution of engineering problems. His work is predominantly intellectual and varied, and not of a routine mental or physical character. It requires exercise of original thought and judgement and the ability to supervise in technical and administrative work of others....
>
> *A Technician Engineer* is one who can apply in a responsible manner proven techniques which are commonly understood by those who are experts in a branch of engineering or those techniques specially prescribed by professional engineers."

One should, however, hasten to add that this distinction, though broadly valid, is not really divisive, as each group depends upon the other and the demarcating line can at times be too tenuous to be distinctively recognizable as separate entities.

Administration of Seventies: Olympian Change

What is going to be the character of future administration in a country like ours, say, in seventies? From 'warfare' to 'welfare', from 'agraria' to 'industria', or from what Morstein Marx calls negative 'nightwatchmanship' to positive 'state-manship',—in short, from passive regulation to positive management is not 'just a small step but a giant leap forward', to use the mighty expression of the Appollo 11 astronaut. The compulsive positivism of modern state, particularly the assumption of new roles as a promotor of public good in the social sector, as a dynamic entrepreneur in economic and industrial fields, and as the fountain spring of all round developmental and directive forces, has its counterpart implications for the public services[6] whose charge it is to marry ideological philosophy with administrative idiom, to transform policies into programmes and to function as a feed-back for suggesting not merely what is rational but also what is feasible.

New administration's challenging tasks in ushering in an egalitarian society[7] based on socialization of opportunities for all, modernization of traditional institutions, re-ordering and rationalizing the system of societal-relationships, etc., as also in bringing about a self-reliant affluent socialist economy through gigantic state projects, production and distribution system, presuppose a major bureaucratic breakthrough, indeed they need a momentous managerial explosion. The basic shift in the nature and style of functioning consequent on development administration's taking up multi-dimensional activities[8] of Olympian proportions is a significant pointer to the vastly different varieties of new skills that management has necessarily to acquire. For instance, administering an awakened agricultural community which is not inert, uneducated or temperamentally fatalistic as before, but which demands all benefits from many institutional and technological innovations and new strategies evolved in the agricultural sector (whose generic name has come to be known as 'green revolution'), postulates a band of agricultural administrators who should not merely have a good grasp

[6] A Hand-book of Public Administration, New York, United Nations, part I, 1961, "To an ever-increasing degree, the effective utilization of national resources depends upon the adoption of the sound economic and social programmes, whose success in turn depends upon an effective public service."

[7] *Ibid.* "The concept of the service state has been almost universally accepted. Governments have taken upon themselves the responsibility for the direction and utilization of manpower, natural resources, and the fast growing technology of the modern world for the creation of an environment conducive to widespread economic and social well being... less and less are they (the people) resigned to lives of poverty, hunger, illness, ignorance and idleness."

[8] For details, see B. K. Dey, "Bureaucracy and Development—Some Reflections", *Indian Journal of Public Administration*, Vol. XV, No. 2 (April-June), 1969.

of science and technology of agriculture but also of other infra-structural processes representing financial, marketing, storing and other relevant inputs of development; what is more, such administrators must be capable of utilizing mass-communication media to their effective advantage.[9] Similarly, managing steel mills, atomic reactors, ship-yards and other sophisticated industrial projects or piloting intricate programmes, like family planning or population control, health, urban housing, education, etc., demand invariably an educated understanding of, and a deep familiarity with, the concepts, principles and practices germane to the concerned sectors of activity, in short, the knowledge of relevant technology of operation in every such functional sphere often requiring a multi-disciplinary approach;[10] they also call for a new orientation-cum-commitment, a new drill of skills involving initiation and maintenance of a continuous harmonious dialogue with both other specialists and professionals in the field as well as the most important dimension in administration, namely, the people. In other words, all those skills, namely, conceptual, technical and human relations, have to be imbibed by the administrators of tomorrow through a healthy synthesization of knowledge at the "campus" and a deep exposure of 'live' experience at the "capitol". This forms the basic foundation for the professionalism-edifice.

New Frontiers

It can confidently be anticipated that the future administrators in charge of managing such a colossal change following from the assumption by the government of transformatory functions in all spheres of societal life must acquire a basic literacy in the following fields, namely:

(*i*) science and technology;

(*ii*) social and behavioural sciences;

(*iii*) economics in government;

(*iv*) management in government and all that goes to make administration management-oriented; modern tools of management and other numeric aids (or quantitative techniques) to decision-making with particular accent on economic analysis.

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[9] Kamla Chowdhry, "Developing Administrators for Tomorrow", *Indian Journal of Public Administration*, Vol XV, No. 2 (April-June), 1969.

[10] *Ibid.* "(The administrator) is the partner of other specialists in the numerous techniques that the modern world has evolved. He must work side by side with experts in social, economic, fiscal and industrial affairs in law and political science, in engineering, agriculture, health, education, science and culture."

(*v*) human relations in management;

(*vi*) impact of 'people' on the policy and programmes for change, nature of group dynamics, and public relations;

(*vii*) research and development.

It is not suggested that future administrators have all to be scientist or technologist *per se*, though the place of the latter in tomorrow's administration will have to be made secure and commensurate with the increasingly important role they are expected to play. The development of science in such fields as transport and communications, electronics, aeronautics, power and indeed weapons of war together with the latest need for experts in the field of social and economic engineering must contribute to the growth of a new tribe of public servants! Quite clearly, in the modern age of technology and science, the experts belonging to these disciplines must find an increasingly important position in society. This is a universal secular trend, much to be welcomed.[11] The general administrators on their part must also imbibe what the Prime Minister calls a broad "scientific temper"[12] which must permeate down the line and replace the earlier amateuristic or simplistic approach. This is possible only through goal-oriented, well-structured training courses and more purposive career development programme operated through a dynamic deployment and placement plan which can make good administrator of a specialist as also an administrative 'specialist' out of a generalist administrator.[13]

Another important area on which emphasis needs to be placed in some good measure is social and behavioural sciences. Indeed, if the new administrators have to function as a catalyst of change, they need to know the 'dynamics of resistance' and other factors involved in the process of change—individual, group and community-wise. When reaching decisions, they have to take into account such social factors as community attitudes and values, rural sociology, and industrial relations. As social element enters into a vast number of administrative

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[11] S. Banerji, "A Unified Civil Service" *Indian Journal of Public Administration*, Vol. IX, No. 2 (April-June),1963.

[12] *The Statesman*, Delhi, Feb. 6, 1970.

[13] The Fulton Report puts great emphasis on training for both categories, namely, (*i*) general administrators, not only in the techniques of administration but also in the subject matter of the two broad groups, economic financial and social; and (*ii*) specialists (*e.g.*, scientists, engineers, etc.), in administration and management in addition to their normal skills in their specialization. The Civil Service College would conduct, *inter alia*, these training programmes.

decisions, it postulates a training in social psychology. The future social administrators, therefore, cannot at all escape taking account of psychological and social trends in the community, social structure, community organization, and group dynamics."[14]

The idea here, again, is not to train the administrator as a behavioural scientist but to give him a conceptual framework that would help him to observe, comprehend, analyse, and evaluate a decision situation in its total perspective, without which observations tend to become biased, irrelevant, and unrelated to 'inner soul' of realities. Like a physician using conceptual knowledge of anatomy, physiology, biology, etc., in diagnosing a patient or in evaluating a public health hazard, etc., an administrator applies his knowledge of social behavioural sciences to deal with human problems.[15]

Similarly, since administration of seventies cannot but have its eyes fixed on widening economic and industrial horizons, administrators have to engage in economic programming, formulation of policies on firm structure, price support, industrial development, expansion of employment opportunities, market promotion, and other cognate functions which presuppose not merely a nodding acquaintance but a basic understanding of the forces influencing and determining the economy as a whole.[16] Decisions with far-reaching economic implications have to be taken on state investment in infra-structure, and the financial implications of various forms of state aid for health, welfare and environmental services have to be examined. It seems, therefore, that knowledge of economics and mechanics of economic analysis are essential requirements for administrators. The application of quantitative techniques of decision-making to governmental affairs has lately acquired significant importance, particularly in the context of enormous potentialities opened up by the vast data-handling capacities of computer and also in the light of other sophisticated tools of management like network analysis, PERT, CPM, OR, PPBS, Management Accountancy, etc., that help in arriving at better and more effective managerial decisions, through rationalisation of criteria for formulation, selection and evaluation of schemes and projects. These modern 'aids' requiring what Fulton calls a "high level of numeracy" must enable the administrators to perform their overall management functions like planning, organising, staffing, directing, coordinating, and budgeting, (*i.e.*, Gullick's POSDCORB) much more effectively.

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[14] T.P.O'Connor, "The Fulton Report", *Administration* (Ireland), Autumn 1968 (Vol. 16, No. 3).

[15] Kamla Chowdhry, *op. cit.*

[16] T.P.O'Connor, *op. cit.*

Management to be fully effective must not merely direct its attention to capital-machine technology but concentrate on an equally important input, namely, human resources, and must believe in and practise human relations approach. Administration after all consists of human beings, operated by persons having feelings, complexes, ambitions of their own and interacting even in their largely impersonalized behaviour while functioning under a formalized administrative framework (often euphemistically called a machine). It is, therefore, very essential that for running the 'show' at a sufficiently high level of efficiency over a long period, not only constantly improving innovations in operative technology would be called for but also new motivations, impelling the administrators to identify themselves completely with the organization goals and to put in their might and mite to productive processes, must also be worked up. Even new experiments may have to be conducted if the vital human element in the administrative 'machine' is not to fail. Which means administration has itself to be human, as well as humane, and not degradingly depersonalized in regard to its relationship with its various client-groups. Indeed, Theory *X* must now yield place to Theory *Y*.[17]

In fact, in the frame of democracy in bureaucracy, the dignity and human value of every individual in the organization must needs to be recognized. What, then, becomes relevant in the changed context is really creating opportunities, releasing potential, removing obstacles, encouraging growth, providing guidance, in short, generating a climate where the higher needs of the organization-man rather than his mere physiological or 'safety' needs[18] can be fulfilled. The future managers must know, not merely intuitively but also by cultivated knowledge and sustained experience, the new styles and management methodology, that will result in more productive group-goals and which can be ignored only on peril of resentment, disharmony and friction, withheld efforts, and programme failures. It is a truism to say that the age of administrators depending on, and managing by 'flair or force of personality or a good honours degree' is gone; the new era is one in which the administrators must learn to do the hard 'home task', be literate and remain up-to-date, and simultaneously inculcate the skills suited to the needs of emerging situations.

While both the qualitative flavour or inner refinements of individual personality, and quantitative managerial gadgets are necessary for better and efficient performance, their operational sharpness would be

[17] Douglas McGregor, *The Human Side of Enterprise*, New York, McGraw Hill Book Company, Inc., 1960.

[18] Maslow, A.H., *Motivation and Personality*, New York, Harper & Bros., 1964.

rendered blunt, if the other equally important area, namely, public relations and popular participation in public programmes, is not adequately cultivated. That management of public affairs is a participative and partnership enterprise and no longer a paternalistic, authoritarian venture, and that people is a dimension in administrative dispensation, significant and meriting much greater attention than it had received in the past, have increasingly to be accepted now by administrators of the new kind. S. Banerji has, in one of his recent articles, drawn pointed attention to the importance of 'public counter' and 'counter clerk' in the new administration. It is difficult to resist the temptation of quoting him here, rather at some length.

> "It is, however, a matter of some regret that such attention as Indian Administration has received since Independence has tended to relate, by and large, to the relatively higher, rather than the so called 'lower levels' of administration. And yet it is at these 'lower' levels that a million points of contact are established everyday between the administration and the common citizen.... If administrative reforms are to catch the imagination of the people of this country, our thinking and action will have to descend to the crucial level of the counter clerk in the millions of public offices at the ground level.... Not only the development in this country but the very contentment of a free people, going through the experience of great awakening to their rights and needs, will depend in a large measure upon the responsiveness and behaviour of administration at the lowest levels. The selection and training of the man at the counter determines the 'face' that administration puts up to the people. The choice of good looking and friendly females for public counters is really an 'administrative device' commonly in vogue in the advanced Western world. At least, the avoidance of the 'dyspeptic' or the 'disappearing' type at our public counters will go a long way to improve the image of our administration."[19]

This concern for and service to the people must be the prime-movers of administrative behaviour, not only on the operative frontier but also right through the line to the top. Just as the cutting edge cannot be allowed to get blunt, so also must the sensibility of "the higher and taller" be kept sharpened. For long the administrators have only felt, and worked under, the weight of the top, but in the years ahead, the administration must have to reckon with the pressure from below, the gush of on-rushing people.

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[19] S. Banerji, "Random Reflections", *Management in Government*, Journal of Department of Administrative Reforms, Ministry of Home Affairs, New Delhi, Vol. I No. 1, April-June, 1969.

Rather than living in a closed and secluded chamber of their own, the administrators of tomorrow must have to come out in the open and face an exciting society of people pulsating with passion, asserting their rights, demanding their dues, and, perhaps, settling the old scores. How can an administrator afford to live in complete isolation from this mainstream and yet be effective? It will only be emphasising the obvious to say that all administrators worth their salt must develop minimum literacy, nay expertise in depth, regarding the complex reflexes of people's attitudes, motives, motivations, psychology, etc., group dynamics, the parameter of the whole society on the move. Indeed, if professionalism in public services has any meaning, it cannot mean anything less than devoted commitment to the cause of 'public interest', not in its wooly, amorphous and unidentifiable sense but in the shape of serving the real interest or cause of the public, *i.e.*, people.

Indeed, the new administrators must function in future, keeping their eyes, trained as they should be, wide open not only to the changing objectives of their organizations, but also to the total societal value. This underpins importance of research, exploring the new turns and unknown watersheds of their functional context and achieving integration of their roles with the overall goals of administration. Research into the diverse facets of administrative universe is not only necessary, but also essential to gain an understanding of the milieu interacting so vitally on the administrator. Study of ecology of administration should, thus, form an absorbing and continuous, preoccupation of new tribe of administrators! Who can, then, deny the pride of place being given to research and development as an area where administrators must take an abiding interest? Administrative intelligence as an aid to purposeful research must needs to be organized in an efficient manner and put to effective use so that 'smog' is cleared up, visibility of goals gets brightened, and means and measures adopted are geared to reach the set ends! Indeed, the new lines of development must also be discovered to be in step with the march of time. When in advanced countries 1 per cent of the GNP is set apart for R & D projects, it is not too much to expect that our administrators at least aim at and attain a minimum research-orientation and follow the path of strict objectivity, *i.e.*, subjecting any question, problem or issue to the incisive scrutiny on the basis of collection, collation and interpretation of all relevant data and adopting an inter-disciplinary approach.

These are some of the significant new dimensions of administration in the years ahead,—resultant of state activism, functional giganticism,

and new developmental strategy, which all call for much intellectualization of administration, technological sophistication and long-range thinking and perspective planning. Can any administrator, in such a changed environment, throw in his proper weight, if he remains a prisoner of precedents, a total conformist allergic to the wind of change that blows over the administrative world? A scientific (or professional) administrator would be sterile and ineffective if he is a 'preserver rather than an innovator'. Most tasks encountered in the contemporary world call for organizations wherein creative thinking and innovation are essential ingredients of survival as well as growth.[20] If even the advanced West suffers from a management gap,[21] which has resulted in a prosperity gap, the developing economies bent upon seeking new frontiers of socio-economic development must before long have to bridge this gulf and catch up fast to avoid stagnation in backwater pool.

The crux of the question then is how we can impart to our administration the much needed management-orientation and make the public services embrace the religion of professionalism, and how soon. Leonard D. White sounded prophetic, when, writing in 1926, he stated that one of the main lines of development which might be expected in the future was "the emergence of the specialist and the expert, the origin of significant economic and professional organization of public employees."[22] The whole stretch of public services must be made expert and trained, and inured to professionalism founded on the finest principles of specialised competence, 'elitism', 'separatism', self-esteem, social status, and strong 'group consciousness.[23] This calls for jettisoning, at the very outset, the nostalgia for inflated virtues of generalism—the tradition of glorifying the cult of the "amateur", "all-rounder" or "gifted layman",[24] who is mistakenly accepted, on account of a chance success in a highly academic examination at the age-range of 21-24, as a "miracle man" competent to hold, up to his 58 years of age and, certainly, without any sustained spell of specialized training, any post in any area from, say, steel, family planning, oil exploration, foreign trade, shipping, heavy engineering to agriculture or even, hospital administration, etc. That this monopolistic control of senior

[20] Vikram A. Sarabhai, "Science and National Goals," *The Indian Journal of Public Administration*, Vol. XV, No. 3 (July-Sept.), 1969.

[21] Atma Ram, "Scientists and Management", *The Indian Journal of Public Administration*, Vol. XV, No. 3 (July-Sept.), 1969.

[22] L. D. White, *Introduction to the Study of Public Administration*, London, MacMillan, 1926.

[23] A. M. Carr Saunders and P. A. Wilson, 'Professions', *Encyclopaedia of Social Sciences.*

[24] Lord Fulton (Chairman), *The Civil Service, Report of the (Fulton) Committee, 1966-68*, Vol. I, London, H.M.'s Stationery Office.

management by generalists is the bane of our public personnel administration has been emphasized, in no uncertain terms, by the Study Team of the Administrative Reforms Commission of India chaired by C. D. Deshmukh. The said Report suggests:

> "The monopoly of generalism should be broken. Specialization should be gradually developed among generalists, and specialists and technical personnel freely inducted into secretariat wings .... We would favour experimenting in the direction of an integrated hierarchy for all these within a wing rather than system of parallel hierarchies for generalists and specialists."[25]

The heavy, almost total, reliance on the generalists deprives, and more will it do in future, the administration of the depth which might come from a large mixture of persons possessing 'basic' or specialized qualifications. The myth that specialists are all incapable of displaying the skills and broad administrative vision necessary for senior management stands already exploded. Indeed, it is difficult to prove that the intensive preoccupation of an expert with a particular field of activity comes in the way of sound administrative judgment. "No self respecting technician can accept the assumption which underlies much official procedure that the acquisition of long training of his specialist skill has deprived him of such common sense and business judgment as he previously possessed."[26] When, on the contrary, one remembers that "civil service is now in the business of managing a highly complex techno-industrial society and this is quite a different job requiring different and more technical skills and an entirely and more positive approach", one cannot but be led to the conclusion that what is required in this changed context is "a more forceful concept of public service and a civil servant who is more professional, adaptive and creative."[27]

How do we envision that public service which is at once generalised, yet should be specialised and professionally adaptive?

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[25] Administrative Reforms Commission (India), *Report of the Study Team on Machinery of the Government of India and its Procedures of Work*, Part II, (Vol. I), Feb., 1968. Most experts regard this relationship as an "unhappy shot gun marriage in which bureaucrats have an arbitrary controlling position", K. Price, 'Government and Science'.

[26] Arthur Newsholme, *The Last Thirty Years in Public Health* quoted in S. Banerji *op. cit.* In fact, the best students of the academic world in India today are, by and large, taking up technological and other professional careers and to hold that they keep their 'brains' mortgaged when they pass out of institutions of their professional learning for taking up administrative jobs or lose it later in life is obviously next to absurd. To work on this basis would be making the society distinctly poorer.

[27] Evidence of the Labour Party in U.K. before the Fulton Committee on the Civil Services.

The Generalist—His Speciality

When one talks of professionalism, one tends to assume that generalism is its opposite pole and that the so-called generalist is really a dilettante amateur with little that is required of him by way of special ability or knowledge or anything like a professional experience of his line. Both these assumptions are to some extent erroneous. The general impression that the generalist can lay no claim to any special ability which is relatable to his specific spheres of duties or his experience is similarly not fully correct. The generalist, in his sphere[28] can also do his bit professionally. As pointed out by S. Banerji:

> "In truth, there are special skills of a generalist administrator which commonly escape reckoning because, as Eric Ashby says, 'these skills, despite the striving of academic departments which teach administration, have not been reduced to order and codified in text books'. Whether in a law and order or other situation of emergency, or in the matter of man-management and public relations and whether this be with non-officials or teams of experts and departmental officers among whom he is required to bring about coordination—all such situations, typical of the tasks confronting a generalist administrator call for, on his part, the qualities of prompt and sound decision-making tact, imagination, initiative, organization and leadership, and other personal qualities which have to be systematically cutivated .... That these reflect a set of 'general' qualities does not take away from the fact that they represent skills of a special kind which administrative experience alone can provide. Indeed, his proficiency in the dynamics of human relations and his gift of objective apprisal of situations would seem to correspond to the special knowledge and skill of the technician."[29]

To assume, therefore, that the generalist can be such an 'ignoramus' of his specific though diverse responsibilities or that any un-initiated one can discharge generalists' many public assignments with ease or that neither familiarity with the functions nor experience of the job is required in his case will be an over simplication of his

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[28] Administrative Reforms Commission, *Report on Personnel Administration*, April, 1969. It mentions three broad classifications of governmental work: general administration, specialized administration and technical and/or scientific administration.

[29] S. Banerjee, "A Unified Civil Service", *The Indian Journal of Public Administration*, Vol. IX, No. 2 (April-June), 1963. It is interesting to note that the qualities that were considered necessary for the Administrative class of U.K. in the pre-Fulton era were "outlook, power and quickness in comprehension, the gift of dealing with people, readiness to take initiative and to assume responsibility" quoted in Herman Finer, *Theory and Practice of Modern Government*, London, Methuen and Co., 1965 (Reprint).

duties. As Wilmerding would say, an administrator "is a specialist but not in the limited field of a profession or a science. His speciality is method, rather than subject matter. He is a coordinator of knowledge rather than a researcher into the minor recesses of one of its branches"[30]

Indeed, at the senior policy management levels of administration, whether of general or technical variety, what is required is not "specific information" or subject-matter specialization, but a mind, which can assimilate the quintessence of all relevant knowledge bearing on a subject; a way of thought, a mental or moral discipline. Enlightened commonsense, analytical faculty, an alert and agile mind, foresight and farsight, capacity for man-management and coordination, etc., are the critical ingredients in a top man as he approaches inter-departmental horizon, and whatever sharpens these qualities, such as training in depth, education *in extenso*, fruitful experience, etc., should also make for inculcation of professionalism. Viewed in this light, administration becomes a profession by itself, method of administering a speciality, and even a generalist administrator a professional !

Need for Specialization

What this line of logic misses, however, is that administrative content has now changed so much and become so complex that commonsense alone, howsoever uncommon and enlightened it may be, will be incapable of comprehending all the mystiques of an obscure field; even an alert mind cannot retain the quality of agility for long, when it has to contend with subjects which are completely unknown; similarly, analytical faculty cannot operate in vacuum if the knowledge or training to apply techniques of analysis is not existent. In other words, the doctrine of 'sound mind' is valid only up to a point and has largely lost much of its soundness and pristine purity in the context of new frontiers of administration, the unprecedented magnitude of tasks in hitherto unexplored fields, and the changed style of operation. Particularly unsound seems to be the concept of 'rolling stone' which gathers no moss in the shape of some substitutive specialization or a cluster of specializations. In his concluding address, on February 25, 1969, at the Conference on Training, L. P. Singh, Union Home Secretary, said:

"With the growing professionalism all round, I feel a stage has arrived when civil servants will have to be trained for particular groups of specializations. The administrative functions have

[30] Lucius Wilmerding, *Government by Merit*, quoted in S. Banerji, *op. cit.*

become so difficult and complicated that a generalist while possessing common sense and understanding of public affairs and management, must have a greater or lesser degree of specialization in some field or other. I do not believe that everybody is capable of framing a good budget, much less a performance budget, or of managing personnel, or planning the lay-out and equipment of an office, or dealing competently with political, social or economic problems of the country, or managing public enterprises."[31]

What, in this background, is needed is to develop a business-like, professionalized attitude and orientation in all sectors of civil service (whether generalist, specialist or technical), to sharpen the edge and brighten the shine, wherever they are wanting. This can be obtained either (*a*) by imparting specialization to the generalists and non-technical services, or (*b*) by giving administrative training to the promising members of specialist or techno-professional services. While the need for giving specialized training to the generalist is widely recognized, the importance of training the specialist in the ways of administration and management is hardly realized. The second type of training is as essential as the first because there are administrative implications of technical development which are more in terms of a series of interrelations that go far beyond the limits of that development and the related discipline.

The specialist or technical services are, by definition, concerned with a specialized technical function for which a pre-entry vocational education is required. In most cases, their post-entry duties and responsibilities provide them the applied training, which supplement their earlier academic-cum-professional education. These services constitute the professional element in the public services right from the start. Though at the higher levels of even such specialist hierarchy, functions become more and more generalized (and less and less technical) and acquire larger administrative dimensions, what, by and large, these specialist cadres lack is the management training—meaningful, methodical, and goal-oriented. That this partial inadequacy, despite their otherwise professional character, should be met, early and effectively, in the larger interest of enabling such an important segment of public services to make fruitful contribution is pretty obvious. Management training for the specialist has, therefore, been put as one of the priority items of future executive development programmes. Indeed, the first item in the training charter of the Civil Service College of U. K., as

[31] L. P. Singh, "Training of Civil Servants—The Wider Perspective", *The Indian Journal of Public Administration*, Vol. XV, No. 1 (Jan.-March), 1969.

recommended by the Fulton Committee, is "courses for the specialists (*e.g.*, scientists, engineers, and architects) who need training in administration and management both early in their careers and later".

Implications of Professionalism in Generalistic Frame

To develop professionalism within the generalist framework, it is first necessary, among other things, to generate specialization, apart from imparting a sense of purpose and direction to it. And this cannot be brought about except through a well-delineated and dynamic programme of in-depth training and purposeful career planning. This has got at least four aspects: one, sectoral (or segmental) analysis leading to a breakdown of administrative activity into certain 'corps' or 'specialisms' like personnel, financial, economic, agriculture, industrial administration, etc.,[32] for acquisition of appropriate expertise. There could be two types of specializations: 'staff' and 'area' or substantive. Two, a systematic scheme of prospecting talent in various services, testing their aptitudes and selecting them for specific sectors where they could be retained on long tenure for area-specialization. Three, intensive training in the concepts, techniques and substantial body of knowledge germane to each such specialism; administrators nominated to a particular sector[33] must be allowed to spend sufficiently long period there, without being shuttlecocked between unrelated fields. These areas should be so structured and organized that administrators would, in normal circumstances, make their career in one such area, but should jump to other, preferably cognate, areas on approach to senior policy management level, where wide-ranging experience may be a distinct advantage. It is, here, in the specially carved out specialized career-sectors, that an imaginative placement policy can play a crucial role, *i.e.*, the postings should be planned in such a way that administrators accumulate a gradually widening range of experience of *related subjects* in a single organization or in a group of related organizations so that

[32] The A.R.C., in its Report on Personnel Administration, lists the following 8 specialisms, in the non-functional area, namely, (1) Economic, (2) Industrial, (3) Agricultural and Rural Development, (4) Social and Educational, (5) Personnel, (6) Financial, (7) Defence and Internal Security, and (8) Planning. In the functional area, unifunctional services, like Postal, Income Tax, Audit and Accounts, etc., have been assumed to be, and treated, *ab initio* specialised and, therefore, professionalised! Patently, unifunctionality alone cannot bestow all the virtues of professionalism on a service!

[33] In the general administrative sector, the Fulton Report mentions two broad areas for acquisition of professionalism by administrators, namely, (*i*) social, and (*ii*) economic and financial, with scope for further specialization. "Each of these two main categories of work", the Report states, "has its own substantial and broadly based body of knowledge. We believe that a civil servant needs to draw on this to supplement his skills as an administrator, if he is to develop the professionalism now needed." (Ch. 2).

This seems to correspond to Deshmukh's area of 'substantive specializations' broadly identified as industries, social services and agriculture.

they see things more *widely* than a narrow specialist and more *deeply* than a mere generalist. Four, specialized training in the principles and practices of modern administrative sciences; in management gadgetry; in tools and techniques of quantitative analysis, etc.—in short, in the entire sophistry which constitutes the core of modern 'decision-making technology,[34] (This management training should be imparted to the specialist or technical services also.) Behind all this lies the basic postulate of a pride in belonging to a specially chosen, exalted group which is capable of achieving excellence and incapable of violating an accepted, well-understood code of behavioural ethics. There is, in this, the further assumption that a specialist, be he a technical or an administrative specialist, is, and remains, committed to his specialism and that the application of his expertise is with reference to highest standard of public, in contra-distinguished to private, individual or group, interest. A kind of rare scruples of say 'I can do no wrong'—variety has to be generated in the group members. This conformity to the integrity norm and achievement-orientation are the real hallmark of professionalism. How do we operationalize this concept in the context of prevalent generalist cult and its primacy over the specialist professions, generally at all levels but particularly in the senior policy management level, forms the crux of the question. Higher policy posts by their very nature cannot be technical posts but would have generalistic overtones, where more than depth in one narrow speciality, breadth of experience through an exposure to a wide variety of assignments, preferably in cognate fields, is required and expected. Even there, the superstructural ornamentation of experience can certainly be better built on the solid foundation of substantive specialisation rather than on the shifting sands of 'greaseless' rotation! One important way this specialization of skills and expertise can be acquired, and then blended with universalization of experience, is through formation of functional 'corps' corresponding to the demarcation of sectors of administration, such as personnel administration, financial administration, economic administration, development administration, etc.

The Concept of 'Corps'—Its Mechanics

A group of civil servants who have specialized in a particular area of administration will form a functional corps. Such men should be on related jobs for a long enough period, for a significant interpenetration of their personalities with the area of administration in which they are involved. This achieves two purposes: deep familiarity with subject-matter and continuity of experience. The concept of the 'corps'

[34] I am grateful to Shri G. R. Nair, Director, Department of Administrative Reforms, for this and some other apt phrases.

should not be taken to mean that it is a closed field of administrative function in which alone an individual should seek his career's ultimate progress. While it would certainly envisage a fairly long and creative spell of specialized work in a particular sector for an individual, it should not generate rigidities that would stand in the way of diversifying their administrative experience. The tenure in a 'corps' should, in short, be long enough to make the 'expertise' an officer has gained in a specific field a permanent part of his mental equipment.

These corps need have no service appellation but should merely be known by functional characteristics of the class of posts for which they would mainly cater, for instance, "personnel officers' corps", "finance officers' corps", etc. for these corps should be made from all service selection sources (whether general, professional or technical) on grounds of merit alone. There should be equal treatment for entrants to the corps irrespective of the service to which they once belonged.

It should be possible to draw to these corps, particularly in the field of development administration, persons of specialized knowledge and experience from the academic and business worlds, to bring in new talent and diverse experience, and to measure the standards of regular service officers against the best available outside. This may mean a break from the conventional closed cadre system that has been operating in our civil service. But where men from the university or from industry should be able to make significant contributions, there should be no objection to make their entry possible. While conditions in this country in terms of technological development are different from those of advanced countries, like the U.S.A., where such "cross-fertilization" has been successfully tried, it can certainly be no argument to prevent experimenting with such induction. A cautious beginning in this direction can be made by bringing in persons of outstanding merit from universities and even private business on contract basis for a specified period.

Optimum development of officers selected for appointment to the corps cannot be achieved or maintained without close attention to the merits and deficiencies of individual officers and careful planning of postings and transfers in their earlier and middle years in such a way as to give the right kind of exposure to the right officer at the right time. It would also be necessary to provide for his transfer to other departments within the sector of administration and for retraining, where needed, to draw the best of him.

This 'corps' concept operates, in the main, at the middle management level where different types of specializations[35] have to be designed for meeting the diverse challenges of work. Indeed, it is this level that mainly acts as the shock absorber and does almost all the backstage work for sound policy making and efficient implementation of such policies and plans (the Deshmukh Report rightly, therefore, terms officers of this level as the "back room boys") and, pressure thus, is most pronounced here for development of professionalization.

The corps scheme does not bar (the intention in fact is that it should encourage) a young promising officer who has acquitted himself well in a particular corps being allotted to another corps to give him experience in diverse fields and prepare him for top management posts. Indeed, when an officer gets funneled into the senior management level, he is already a tempered steel. With his specialized backdrop, in one or more areas and a rare flair for administrative management, he is expected to function as a fully professionalized civil servant. Assumptions apart, suitable programmes for further and continuing education of the senior management should also be drawn up. Indeed, when knowledge is known to double itself every ten years, the senior management can remain complacent about updating their knowledge only on pain of vital efficiency and effectivity. The professionalism-buck must not, therefore, stop at the door-step of senior management. Indeed, the fresh air of professionalization must force entry into their chambers also. Self education, reflective training programmes, study tours and orientation trips, seminars, conferences and workshops, sabaatical leave, attachment to universities and other institutes of higher learning, etc., could be some of the effective mechanics for the busy top to make good the 'equipment gap'. The plurality in the senior management,[36] should by itself make for a healthy cross-fertilization of experience.

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[35] *The Study Team (Deshmukh) of A.R.C. on Machinery of Government and its Procedures of Work* mentions three broad types of specializations for headquarters works, namely: (1) Substantive specialization, (2) Staff Specialization, and (3) Specialization in headquarters work. For details, see Ch. VI. Sec. III of the *Report*. How should these specializations be acquired, has also been dealt with in the outline of different kinds of training as stipulated by the Study Team *vide* paras 6.36(3), 6 36(4) & 6.36 (5).

[36] *Ibid.*, "Senior management positions should be open to all sources and should not be the preserve of any cadre or set of cadres" (Deshmukh Report). There is a striking identity in this respect between Deshmukh and Fulton, as the latter also writes: "No posts should be the preserve of any group except insofar as the individuals comprising the group may be uniquely qualified for them, *e.g.*, doctors for medical posts (Chap. 6. para 214 of the Fulton Report).

Also see L.P. Singh, *op. cit.*, "For top most administrative jobs at levels where administration becomes something akin to statesmanship, the net has to be cast wide to get from the specialized groups men with conspicuous managerial ability and wide understanding of problems."

India's Experiments with Professionals

Before the curtain is drawn, it would be less than fair not to mention that though the commanding heights of Indian administration are still by and large the generalists' preserve, wind of change has started blowing over the administrative landscape and some unmistakable signs of professional-cum-specialist 'dent' are also evident. The Department of Atomic Energy has all along been headed by a nuclear scientist; Ministry of Law by a member of the legal profession or service; and the Railway Board by members of the Railway Services. The Department of Economic Affairs of the Finance Ministry is now headed by an Economist. The constitution of so many professional services like Indian Economic Service, Indian Statistical Service, Indian Service of Engineers, Indian Medical and Health Services, etc., speaks volume regarding the trend. Again, in organizations, like Council of Scientific and Industrial Research, and regional laboratories under its charge, it is the scientists who preponderate, though 'general bureaucracy' also tries often to dominate the scene in an area generally foreign to it. Staff agencies like D.G.T.D. and other bureaus and boards provide much needed professional advice to ministries at a sufficiently high level, though not from within the policy-making hierarchy but only from a distance. Perhaps, this integration is not far off, and already some attempts at such integration have been made notably in the Home Ministry. It must be conceded, however, that professionalism as has been injected into the veins of Indian administration has so far been of sporadic character and does not seem as yet to have been introduced as part of a design or conscious plan or a long-term policy. While it is not suggested that there should immediately be a total blood transfusion, after emptying all the old bottles, the need for adequate doses of professionalism is inescapable and, hence, requires to be straightaway recognized and acted upon. One cannot certainly fight modern space-era weapons with stone-age implements. To be in step with the times, one must heed the zooms of 'jumbo' jets on the horizon and not remain content with the rattles of bullock carts.

CONCLUSION

The new directions, which the administration of the 1970's is certain to take, should throw positive guidelines for the entire civil service, not excluding the top, to catch up and that too quickly enough, if the civil services are not to be overtaken by future events. The administration can no more rely or stand on the thin crust of amateurism. The questions posed by the futurology of administration and its multi-dimensional ramifications have to be answered, and professionalization of civil service seems to be the only answer. ∎

MANAGEMENT OF RESEARCH

A STUDY OF INDUSTRIAL RELATIONS CENTRES IN INDIA*

K. N. Vaid

THE study and research of industrial relations is of relatively recent origin and has acquired a greater significance in countries which are undergoing rapid economic development within a democratic political framework. Freedom of association for promoting one's economic and social objectives, right to strike and expression, free press and the existence of several political parties ranging from extreme left to far right tend to give rise to an articulated public opinion, heavy and often politicalized organization of labour and employers and several other competing forces within the industrial setting. In order to secure industrial peace necessary for uninterrupted production, the governments take legislative and other measures to ensure viable industrial relations. All this makes the study and research of industrial relations meaningful, interesting and complicated: all the same more important. The subject has become an area of research and teaching to varying degrees at many places in India, and I believe in a few other Asian countries also. The central concern of this paper is to examine the working of industrial relations' centres and institutes and, in particular, to focus attention on some of the major problem areas in their orientation, finances and management. The discussion is based on the Indian experience though the comments and opinions may also prove useful to those engaged in similar work in other developing countries.

BACKGROUND

Origin

The growth of the industrial relations' teaching and research in India has been conditioned, amongst others, by its historical origin, the system of education in the country and the dynamic demands of a developing economy. The study of industrial relations in India owes

* The author is grateful to Mr. Arun Joshi, Director of the Shri Ram Centre and Mr. Fred C. Munson of the Michigan Business School who, by continuous interaction, contributed to give shape to his ideas.

its origin to the social concern for labour.[1] In mid-twenties, Mahatma Gandhi organized industrial workers into the 'labour' front of the freedom movement. He laid emphasis on fair deal to labour and on their welfare needs. Large scale migration to industrial areas during the years between two world wars further augmented the need for labour welfare. In mid-thirties, dozens of voluntary bodies could be found engaged in labour welfare work in cities like Bombay, Calcutta, Madras and Kanpur. In 1936, the Tata Trust in Bombay set up a social work school to train labour welfare workers with a view to help improve the quality of welfare services to labour. This marked the beginning of the teaching of 'labour' subjects at academic level in India. Most of the other schools of social work which came into existence during the subsequent years taught courses not only on labour welfare but also on personnel management and industrial relations. Thus, it was the schools of social work who first gave courses on labour welfare, personnel management, industrial relations, labour economics, etc. The courses were geared primarily to the needs of welfare personnel. This gave a labour welfare orientation to industrial relations teaching. The tradition stayed and grew strong due to the government's stress on welfare.

Teaching

Industrial relations as a subject is not taught at any of the Indian universities. Courses on social sciences are offered by 51 (out of a total of 70) universities. Industrial relations subjects usually comprise of one 'optional' paper in most of the traditional social science teaching programmes. The following table shows the status of the teaching of industrial relations subjects:

STATUS OF INDUSTRIAL RELATIONS SUBJECTS AT THE INDIAN UNIVERSITIES[2]

Subject	*Number of Universities Where Subject is*		
	Optional	*Compulsory*	*Not taught*
Labour Economics	32	6	13
Industrial Sociology	12	2	37
Industrial Psychology	19	3	29
Labour Legislation	9	2	40
Personnel Management	25	8	18

[1] For a detailed discussion on the subject, see K. N. Vaid, "Labour Welfare in India", *Encyclopaedia of Social Work in India*, New Delhi, Publications Division (Ministry of Information and Broadcasting), Government of India, 1968.

[2] For a detailed reference on the subject, see K. N. Vaid, "*Industrial Relations Teaching in the Indian Universities*", I. R. S. Series No. 1, New Delhi, Shri Ram Center Pre ss, 1965.

It will be observed from the table above that whereas Labour Economics and Personnel Management are being taught in many of the Indian universities, Industrial Sociology has not received recognition from its parent discipline. This also explains, at least partly, the insignificant contribution of sociologists to industrial relations. It is interesting to note that the teaching of labour legislation has not been developed despite the fact that the Indian industrial relations system permits lawyers and judges unlimited scope for making contribution to it. Further, neither universities nor any institute offer courses on industrial relations' research methodology. Courses on social research, wherever given, do not draw concepts and tools from different disciplines and remain useful for research within the framework of a particular discipline. The course work in statistics is elementary in all social science subjects (except Psychology) and imparts little skills in quantitative methods.

Thus, we find that no university has either a department of industrial relations or an integrated course in industrial relations. For the same reason, the universities do not engage themselves in any extension work in labour education, management development or industrial relations. Only three institutes in the country have post-graduate (Master's degree) programmes in 'labour'. The Tata Institute of Social Sciences, Bombay, runs a Master's degree programme in Personnel Management and Industrial Relations. The Bombay Labour Institute prepares students for the M.A. degree in Labour Welfare of the Bombay University. The post-graduate course of the Xavier Labour Relations Institute, Jamshedpur, has been recognized by the Government of India as equivalent to M.A. in Industrial Relations.

Data and Information

Data gathering is done mostly by the governmental agencies. The Labour Bureau, Simla, the Census of Manufacturing Industries (CMI) and the Annual Survey of Industries (ASI), the Census Commission, and the Directorates of Economics and Statistics* as well as Labour Departments of the State Governments are the principal agencies that gather and release, on a continuing basis, most of the data available in labour and industrial relations. *Ad hoc* surveys are published from time to time by different governmental agencies or departments, and other private organizations. Again, most of the labour and industrial

* Almost all publications brought out by the Central Government and its ministries can be ordered from the Manager of Publications, Government of India, Civil Lines, Delhi-6 and those of the State Governments can be enquired with the Manager, Government Printing & Stationery Departments at different State capitals.

relations literature has been published by the government. It is only recently that the publishing trade has begun to take interest in this subject and several publications have been brought out during the last five years. Three Indian journals brought out from India are devoted to the field of industrial relations.[3] A few other journals give adequate coverage to the subject as and when necessary.[4]

ORIENTATION

What should be the orientation of an industrial relations centre in a developing country like India ? Should it be concerned with teaching or research or with both: in the latter case what should be the mix? What should be the level and nature of teaching programmes? What should be the focus of research? These are some of the more important questions which should be considered in order to understand the orientation, role status and structure of industrial relations centres.

Centre Defined

Let me state what I mean by a 'Centre' so as to distinguish it, let us say, from a university department. A Centre is a specialized agency concerned with the application of scientific thought to concrete situations and phenomena with a view to multiplying the effect of effort. It is a place where ideas, tools, techniques and methodologies are developed, tested, modified and communicated with a view to improving practice and knowledge, and to increase human welfare in the ultimate sense. In order to encourage the spirit of experimentation and innovation in a Centre, the bureaucratic processes are developed as facilitating services rather than control mechanism. The goal of the Centre is to bring its expertise to put the existing knowledge into a usable form so as to enhance the development and happiness of the community in a more immediate and direct manner.

Role in Teaching

The industrial relations centres will have less ability to serve their above-stated objectives, if they were to undertake teaching at undergraduate or graduate levels. In addition, there will be two other

[3] They are namely: *Indian Labour Journal*, published by the Labour Bureau, Simla; *Indian Journal of Labour Economics*, care Department of Economics, Lucknow University, Lucknow (U.P); and, *Indian Journal of Industrial Relations*, published by the Shri Ram Centre for Industrial Relations, 5 Pusa Road, New Delhi-5.

[4] For all periodicals in the field of labour, please refer to "*Indian Journal of Industrial Relations*", Vol. 1, No. 4, April 1966.

major disadvantages. First, teaching will require Centres to invest a major part of their scarce resources in educational programmes. It might be more appropriate to stimulate universities to divert their funds to teach industrial relations courses. Second, in order to attract students, the Centres will need to gear their teaching for the award of specific degrees or diplomas. By seeking that such degrees are sought to be conferred by some universities (which is inevitable), the Centres will invite external control and bureaucracy which is not always healthy. On the other hand, if the Centres award their own diplomas, they will be found competing with universities—a situation which is unfavourable to Centres as well as not to be liking of universities.

However, by suggesting that the Centres should not teach courses for degrees or diplomas, I do not imply that they should not take interest in promoting teaching of industrial relations in universities; for such a position will be detrimental to the professional and institutional interests of the Centres themselves. The Centres will have to play their part in stimulating universities to teach industrial relations courses. A greater interchange or interaction amongst universities' and centres' personnel will be a step in the right direction. Centres can also encourage their staff to accept teaching assignments at universities and to participate in curricula development as well as in students' evaluation. Being specialized agencies having professional competency, library resources and other research support services, the Centres can serve as seats of advanced research where universities could send their Ph.D. students and, where other scholars interested in the subject could work.

Another area where Centres could be useful is the extension work. Universities generally work in ivory towers and have, so far, not developed competence to serve the needs of practitioners in industry and business. Industrial relations centres can fill this gap by organizing training programmes for different levels of personnel in enterprises and trade unions. By undertaking such programmes, the Centres will serve the needs of practitioners, ensure a much faster communication of research results to the consumer groups and expose their own staff to industrial problems more meaningfully. The extension work could also become a source of revenue over a period of time. Experience has shown that such courses must be of short duration, sharply focussed on one or two concrete problem areas, and utilize teaching material drawn from indigenous sources. The managers or union leaders will have to continue to utilize respective university departments for formal academic teaching in Economics, Political Science, etc.

Focus of Research

The focus of research carried out at industrial relations centres has been a subject of debate for some years now. A distinction has been made between pure research (theory building with no obvious immediate application), basic research (arriving at generalizations which are widely applicable to several problems) and applied research (designed to solve a limited, specific and immediate problem). It has been stated by several educationalists including those in the Centres that whereas pure research is primarily of interest to universities, the basic and applied research should be the principal focus of industrial relations centres. The whole discussion is rather hypothetical. First, it is obvious that a developing country must give priority to such researches which make direct contributions to improved practice, either by solving concrete problems or by establishing conclusions capable of wider application to a variety of situations in real life. Second, till it can afford the luxury of sufficient resources, a country like India will do well to profit from the discoveries made and truths uncovered by the affluent nations. In the context of current resources, India's investment on pure research will be as unwise as spending money on space research in preference to building fertilizer plants. Pure research, howsoever glamorous and academically satisfying, is a luxury, we cannot just afford. Thirdly, it would be appreciated that empirical research needs theory or a set of concepts to provide the framework for analysis. Empirical research may yield descriptive data and provide the basis for short-term policy determination; but it cannot progress significantly without the guidance of verified knowledge. Similarly, case studies, not replicated and not tied in with other related studies, are likely to be of much limited use. Additive studies, on a theme, built on each other, piece by piece, have a special value for both improved practice and improved knowledge. In order that industrial relations research may play a more influential role in the development of the country, a series of long-term empirical and additive studies based on carefully formulated theoretical propositions will have to be undertaken.

The Independent Role

Another important role that industrial relations Centres are generally called upon to play in many developing countries is to depute their experts to participate in policy making by sitting on various committees and commissions as 'independent' persons. This kind of participation could prove satisfying as well as suicidal to Centres. The committee work gives a sense of participation in policy making to individuals and makes them a part of the political power structure in the country.

It brings power, prestige, travel, money and sometimes provides a spring-board to jump to higher offices. Thus far, it may not be bad. However, individuals may develop vested interests in committee work which might lead them to compromise their 'independent' status in order to seek continued patronage of the administrator. The 'independent' status may become either a validational function or mediation in conflicting interests with a view to securing or enforcing consensus. Industrial relations centres will need courage to reject participation in committees, if the 'independent' function cannot be discharged with integrity and objectivity. This also implies that the Centres will do well to steer clear from either taking political positions or getting involved in current public issues or aligning themselves with any single interest or social group. Any departure from an 'independent' position is likely to impair the Centres' objectivity, reliability and scientific attitude.

The orientation of the Centres as suggested above also implies that they should better stay outside the hierarchy of the universities and function as autonomous bodies. They should undertake teaching to supplement the work of universities or to extend it to non-student groups. The research activities of these Centres should be focussed on basic and applied research. In their functioning, the Centres should apply the high standards of academic work to contribute to improved practice. Whereas the individual scholars could look to universities as their reference group, the institution should look to industry and the enterprise to determine the nature and scope of its work. Further, the Centres should zealously guard their 'independent' status and stay clear of political positions and alignments which might impair their objectivity and tamper with scientific attitude.

FINANCES

Government

In India as in many other developing countries, the government is the principal financier and sustainer of research in various fields of social sciences, natural sciences, and technology. The Ministry of Education, Government of India, and the University Grants Commission disburse funds, administer grants, and standardize procedures and norms for the purpose. Several other ministries and government departments as well as the Planning Commission also sponsor research studies with a view to either generating data necessary for policy formulation or evaluating a particular programme. Apart from the fact that the government funds are necessary for the existence of

research institutes, and that many may extinguish without it, these funds have promoted minimum standards of pay and professional qualifications of research personnel. However, often the minimum also tends to become the optimum resulting in the deployment of low salaried and low skilled personnel in research. Further, the public funds, more often than not, bring in a plethora of rules and regulations, forms, returns, etc. As more funds flow in, the senior scholars who act as project leaders get tied up with administrative routine, with the result that the bulk of research work falls on the shoulders of junior scholars—with anticipated results. Further, the grants are made in support of specific projects and the project-charged staff live in perpetual job insecurity and the institutes are also unable to stabilize their research facilities. Again, whereas the government has shown keen interest in determining goals, time schedules and terms of reference of projects at the time of sponsoring them, it has generally been not vigilant in ensuring that such decisions are implemented. Scores of studies, involving huge amounts, have not seen the printers' ink and are unlikely to do so. On the whole, it might be said that whereas a research centre has to accept government grants, it must continuously seek funds from other sources with a view to preserving its organizational health and vitality. On the other hand, the government may do well to pool together all research funds available with its different sub-agencies and administer it in a coordinated manner. A Social Science Research Council on the lines of Britain was set up in December 1968.

Foundations

Another source of funds are the foundations—both Indian and foreign. The Indian foundations are few as well as small. They are mostly created by different industrial houses and administer small funds. The Tata Trust, the Birla Foundation and the Shri Ram Foundation are some of the better known foundations who support a network of agencies. In any case, this is a very recent development and its impact could only be evaluated after a very few years.

Several foreign foundations have taken active interest in promoting research and training, particularly in the area of management, industrial relations and development in general. The resources have been made available for different activities to include sponsoring specific research projects, piloting new programmes which could go on their own steam after initial start, building resources and structure for institutes to help them improve efficiency, etc. The success of most of these investments remains uncertain. Occasionally, the foundations came with some pre-conceived ideas, found local people who were willing to work them

out, and made investments. At times, the programmes administrators, relying on their hunches, made grants to people and institutes whose principal activity was 'grant-baiting'. A new class of people of has come up. They specialize in cultivating foundation personnel and make a high living on their funds. However, whenever a foundation was able to understand the felt needs of local agencies, came with an open mind and involved competent local persons in policy planning, laid emphasis on institution-building programmes in preference to *ad hoc* project grants, and supported programmes which could become self-supporting in due course of time, the results were satisfying both to the foundation and the local agencies. The foundations can and are playing important roles in the development processes of several Centres. Industrial relations centres can profit from these foundations provided that the inflow of resources comes in support of institution-building programmes determined by the local people.

Industry

Industry is another source of funds. It has a big potential for supporting research and teaching activities in the country. Unfortunately this resource remains, by and large, untapped. This is partly due to the excessive government patronage to research and teaching, and partly due to the research results and the scholars not having particularly made themselves useful to industry. If scholars could learn to establish rapport with industrial managers and made efforts to undertake research and training whose results could be utilized by industry, funds will start flowing in. The limited experience at the Shri Ram Centre in this regard has proved encouraging.

Thus, it can be said that although the government is likely to stay as the principal financier of teaching and research in most developing countries, the academic bodies should try to reduce this exclusive dependency by exploring alternative sources of funds. The funds made available by foreign foundations should be invested in institution-developing programmes or experimental projects which are likely to catch up and become self-supporting in due course of time. The research Centres need to pay special attention to the needs of industry, bring research to serve the latter, and take back funds as per requirements.

MANAGEMENT

A Philosophy

In order to grasp the problems of research management, one

needs to appreciate several peculiarities of a research organization. An assumption appears to be widespread that the retired or likely to retire senior civil servants make good directors of research institutes; or that someone who is a competent scholar will also be an effective manager. This assumption has led many research organizations to become just a replica of the civil service: large bureaucratic establishments producing notes and memoranda, keeping themselves busy in making rules as to why certain things can or cannot be done; and consuming most of the time of the seniors and other talented persons in the process. One is even tempted to say that a good deal of non-productive research, brain drain, lack of impact of research on practice and a feeling of stagnation amongst scholars can be attributed to this malady. An academic organization is very unlike a government or a business office or a production unit.

Research is the process of innovation in the world of ideas. It requires an attitude that gives unquestioned obedience to the discipline of scientific method, a frame of mind that continuously evaluates the on going results of a research project, and an alertness of mind that stems from the desire to learn rather than to prove. The scholar deals with a problem which he believes to have importance, lend itself to significance of results and correctness of methods, and can logically be argued with other scholars anywhere. All scholars may not achieve this excellence of standard, but most of them like to strive for it. In order to achieve excellence of quality and efficiency, the key controls must be internalized. The attempt to use external controls is unlikely to yield results. It might be efficient to order a clerk to put up a file, or a mechanist to rub a surface smooth, but it will not work if a scholar is ordered to produce a creative insight. Whereas a bureaucrat acknowledges that his work is useful to the organization in some ways; the scholar, more often than not, thinks that the organization is somehow useful to his work. The bureaucrat must understand his inability to control results; and the scholar must accept restraints on expenditure, time, and curiosity about irrelevant matters that might accompany research conducted within an organization.

Identification of Goals

Another major problem in the management of research is the lack of clarity of goals of individual researchers as well as of research organizations. Most scholars in universities maintain that their primary professional interest is the creation of knowledge, building theory and to do 'academic' work only. They are cynical about research that is applied, problem solving or geared to the needs of policy formulation. Such an attitude has no relation with either the abilities of

these scholars or the resources that they have. More often than not, it reflects either ignorance or a hang-over of the colonial past. There are many scholars who are brilliant as well as producers. But there are many more—and they constitute the bulk—whose writings are at best a rehash of the work of some other authors and whose research activities are confined to data gathering mostly. Scholars need to make an assessment of their real research potential. After all they can do only such work as is permitted by their abilities and resources. And the results of their research should be significant to the country and its development. Similarly, a research organization needs to know its purpose. Although both the processes will go on simultaneously within it all the time, yet an organization needs to establish whether its primary purpose is to discover new knowledge or to work with existing knowledge to improve practice and make the knowledge more usable. The two purposes lead to different kinds of organizational structures. A knowledge producing organization requires departmentalization by the field of knowledge, such as Psychology, Sociology, and Economics. A knowledge-applying organization will need a structure which could serve the requirements of fields, such as labour market and manning problems, salary and wage administration, incentives and work loads, union-management relations, etc., and other staff services, such as survey, sampling, interviewing, and data processing.

A focus on knowledge requires an environment that encourages specialization within an intellectually unified field (a discipline), while a focus on application requires specialization by the nature of problems. Scholars in pure research organizations will have fellow scholars and universities as their reference group: those in applied and basic research organizations will have to extend their reference group to include the users of research in addition to the scholars. A purist will normally work on a problem all by himself and stay within a small group of colleagues. The applied scholar will need regular contacts with wider groups relevant to his work. Further, an applied research organization requires considerable organizational flexibility so as to make it possible for scholars to shift to a wide range of subjects.

Scholar Administrator

One of the most damaging practices in an academic centre is to assign the management function to scholars as a matter of routine. Very often, one gets the impression that scholars hanker after administrative, managerial and supervisory positions in their respective organizations: again, a hang-over of colonial traditions. Also, there

seems to be an assumption that since a good scholar is better than poor ones, he should also be over them. Ability to do research or teach is taken as synonymous with the ability to manage people. Alas, most scholars do not know that they are (or could be) bad administrators. Very often they complain that they are over-controlled, but are measurably worse when it is they who control. Their concern for detail and thoroughness makes them treat their subordinate scholars as tools rather than as colleagues. Often their very abilities as scholars prove to be the disabilities as administrators. The ability to sustain an intensive and narrow focus on a single dimension of a problem is vital to the work of a scholar. But an administrator must switch his attention from one problem to another, and be adequately effective in all. A scholar must look for details and empirically supported inferences: the administrator avoids details and works with best guesses constantly. Thus, it is vital not to confuse the scholastic ability with administrative skills. If a scholar aspires or is required to become an administrator or head of an academic institute, he must understand that he will have to give up many attitudes that made him excel as a scholar and pick up new ones in order to do reasonably well in the new job.

Research Team

Interdisciplinary problem: The academic background of the research staff of a Centre, and the nature of its mix continues to be one of the unresolved managerial problems. It is our experience that barring survey work and data collection from primary sources, it is uneconomical and unworkable to set up research teams comprising of persons drawn from different academic disciplines. The problems of semantics, choice of variables, and alternative strategies of data analysis assume huge proportions in an interdisciplinary research team. Time schedules and funds become irrelevant and project seldom gets completed. By saying this, I do not imply that work should be stopped on developing interdisciplinary concepts or that various disciplines may not have a common social science core. I only suggest that this work could be undertaken by those Centres who are in a position to divert a good part of their resources to it.

If a team is necessary for a particular project which has a budget and a time schedule, it might be more useful to draw scholars from the same discipline and encourage them to borrow concepts, tools and methods of other disciplines, if necessary. The research climate in an applied research centre—as most industrial relations centres are—will facilitate this process. Problems need solutions, and they do not

particularly respect the academic discipline of a scholar. If a scholar's discipline does not have usable tools, he must look for the same in other disciplines. Not all scholars have the ability or the perceptions to borrow from other disciplines. One has to be good in one's own discipline and field. Only a good economist can utilize concepts or tools of psychology in his own work and *vice versa*. The industrial relations centres, particularly in developing countries, will do well not to give unduly more importance to interdisciplinary or multidisciplinary competency in their scholars. They should recruit academically sound people, who know their theory properly, expose them to problems in the field, allow them time to make mistakes and learn, and they will shape well unless, of course, a mistake has been made at the recruiting stage. As a long-term policy, the Centres could recruit outstanding young scholars and put them through a period of training in the concepts and methodologies of other disciplines.

Reporting relationships: The nature of reporting relationship within a team is vital to its ability to succeed. (Here, we are not referring to survey work.) The first need is to reduce the length of hierarchy. Nothing can be more confusing than to set up a project team having a number of senior and junior investigators reporting to a hierarchy of supervisors, research officers and assistant and deputy directors; and everyone has an overlord—the project director. The investigators collect and sort out data, supervisors prepare drafts which are corrected by officers, which are verified by assistant directors, further refined by the deputy director and finally signed, authored and released by the director. The existence of this style of operations may surprise many; nevertheless it is not a typical of what actually happens. This style of operation is a sure way of setting up a failure mechanism of producing undigested reports, and of demoralising young scholars.

The second need is to avoid setting up teams comprising of more than one senior scholars. If one is made the chief of the project, others are more likely to offer less co-operation. If all are given equ[illegible] sibilities they might exercise pulls in different directions and [illegible] will suffer. My suggestion to the research organizations wil[illegible] in the interest of quality of results and efficiency of operations, the research teams should comprise of scholars drawn from the same academic discipline. The structure of the team should be centrifugal: one chief and everyone else reporting to him directly. Whereas the professional status of different team members could be reflected through salary and authorship policies, no one should be over anyone else, except, of course, the project leader.

The Director

The principal executive of a research centre has a very crucial role to play in setting standards and pace of work therein. He is the principal director, motivator, coordinator, enabler, validator and manager of men and activities in the organization. His is a very delicate role. He must keep seniors and team leaders motivated to meet the required standards and at the same time protect their subordinates from pressures that will demotivate them. He must stress high standards of output along with the need to conserve resources. He must encourage experimentation and innovation but discourage irrelevant curiosity and idleness. He has to create climate for research, help people to change their perception of organization's purpose and apply pressures that increase the efficiency of others. On balance, it might be useful for him to go on the assumption that senior scholars know their job: if they don't they need replacement rather than supervision. It will free him and permit time to give attention to human-resource building, organizational development, standard setting and an ongoing evaluation of work, men, structure and procedures, as well as needs of the centre and country.

Manpower Problem

Academic institutes, particularly the research centres, are experiencing a great difficulty in getting competent scholars. On one hand the availability of Ph.D.s in social science subjects has increased substantially over the years. And on the other hand, several research and teaching positions continue to remain vacant as suitable scholars are not available. The problem is genuine and a complex one. As a result of the increasing industrialization as well as the traditional prestige association with senior civil service jobs, the cream and the best amongst the students go in for further education and training in technology, natural sciences, and civil services. Students generally opt for social sciences as second or third choice. (The women students might be an exception.) Again, many students decide to go in for Ph.D. as they find nothing useful coming their way after M.A. The problem of finding a job is postponed for some years in the hope that things might be different later on. Thus, most research institutes find that their labour market is dominated by highly qualified, poorly trained, less gifted and poorly motivated job seekers. It is easier to fill low skilled and poorly paid jobs with Ph.D.s than to attract a young, talented M.A. with a spark in him on high salary. A research centre has three alternatives open to it. First, it can set up a low level salary structure, and employ the best among the available who want to join

in. The centre will do this at its own peril. Second, it can hire researchers of demonstrated competence at high prices. The supply is likely to be unsatisfactory. There are only too few people of this calibre around: and they are too involved in work at their current places. There, the centres can look for students (not degrees) with a high probability of becoming competent researchers and face the costs of time and money to train them. The third alternative is certainly in national interest, and is also in the long-run interest of the organization itself. However, accepting this alternative will mean that the development of scholarship becomes an explicit goal of the organization having bearings on its structure, budgetary decisions, standards of evaluating efficiency and output, and supervisory loads.

Financial Management

The styles of financial management of an industrial relations centre should be geared to suit the dynamic nature of the institution. Attention may be drawn to several pitfalls in this regard. First, there is a problem of balancing grants and sponsorship income. Whereas, a major grant from a single source can sap the vitality of an organization, its absence may be perceived by staff as lack of stability and make them feel insecure. An emphasis on seeking sponsors for research may bring scholars in more intimate touch with problems in the field and involve sponsors in the success of a study; and over emphasis on sponsorship may lead the Centre from research to the business of research besides the loss of many scholars who get picked up by industry in the process of their work. Second, the problem of balancing overhead costs with research costs is a continuing one. A Centre has to maintain a certain minimum number of support personnel, such as for establishment, administration, library and similar other services. These are the fixed costs. The abilities of these personnel are flexible in catering to the needs of research staff. A centre employing too few researchers may experience heavy overhead costs, making each project expensive. It may, therefore, find that in order to function economically, it must operate on a fairly large scale, conducting several research studies at the same time. In order to keep overhead costs at about 15 per cent of the total costs, it might be necessary to run 12 to 15 projects at any point of time involving a core staff of 25 to 30 full time researchers. Third, the Centre's income must increase continuously without which even the existing level of research activity cannot be maintained. The continuously rising cost of living—a feature characteristic of most developing countries—increases operational expenses from year to year. Annual increments of employees inflate the wage bill. Unless the income also increases, a centre

may find itself shrinking despite all efforts to the contrary. Finally, a centre may do well to establish a Central Research Fund. There may be occasions when the institution is interested to work on a problem for which no one is willing to pay. Besides, the cash flow situation is seldom to the liking of the institution. The commitments are fixed and must be honoured regularly and at stated frequencies. But those who have to pay do so at their own convenience. Generally, there is a time lag in the flow of funds. Also, it is not always possible to predict the availability of sponsored research. Somehow, its flow is lopsided. There are periods when there is too much to do and at times the entire group may be busy on institution-financed research. The Central Research Fund is a handy device to absorb the vagaries of sponsored research.

To conclude; industrial relations centres in a developing country should be very much a part and parcel of the developing efforts of the community. They have the onerous duty to discover continuously ways and means of making knowledge useful and usable in increasing goods and services, promoting harmony between various social groups and improving human welfare. For this, I believe, the institutionalization of research is necessary for its efficiency, sustenance, and growth. Those entrusted with the task of institution building need to be innovators in their approach to the process of managing research. There are no short-cuts and no ready solutions. A great sense of pragmatism must prevail all around.

COMMENTS

(In this feature we give comments received from the readers on the articles published in the previous two issues of the Journal. The comments should be critical and thought-provoking, and confined to the major points made by the author(s), inadequacies in reasoning or data, or any new solution to the problem which suggests itself to the reader. They should not normally exceed 1,500 *words.—Ed.)*

SATISFACTION OF AN ADMINISTRATIVE CAREER*

This article by P. R. Dubhashi is thought-provoking. But one may well ask: Why this solicitude for the satisfaction of an administrative career? It is a fact that all kinds of work cannot give satisfaction to all. A business-man, a doctor, or a lawyer may well be dissatisfied with his assignment if he is unduly concerned with the stigma attached to the profession.

Work, it is said, is not merely a physical necessity but a psychological one as well. And for our aggregate living, socially useful work is equally necessary. To a social thinker, therefore, it is redundant to compare two jobs and place one after the other. For example, it is very difficult to determine as to whose job is more important in the series—teacher's, engineer's, administrator's, journalist's. Nor is this all. One may not excel in all the assignments equally. All works—the work of a valet, a butler, a cook, a mali, a dhobi, a maid and an ayah not excluding—require specialization. Excellence in one's social posting gives satisfaction. It is, therefore, unimportant to classify social beings as first rate, second rate, etc., and put one in a vantage position over the other. One should not forget, a scientist may prove to be a worthless administrator. 'Place of administration' in national life is already determined—administrative knowledge and function are essential for the society. It is for the authority to determine the attributes of an administrator and prescribe rules for the same. Surely, the virtue of an able administrator is not a first class university degree as Macaulay is long dead and with the advancement of scientific knowledge and changed situations, fixation of new criteria for a good administrator is overdue. Glamour is equally meaningless as it gives birth to a false sense of vanity and to snobbery, which stands in the way of fostering team spirit.

In a truly democratic society, power, status, or wealth of an individual should not count much. Social living is a joint endeavour and all of us

* The original article of this title by Shri P. R. Dubhashi was published in the Journal in Vol. XV, No. 1 (Jan.-March), 1969.

should jointly contribute to the course of developments according to our station and duties.

—DEBI PRASAD MUKHOPADHYAY

Author's Rejoinder

It is natural for a person in the administrative career to have a solicitude for the satisfaction that it offers. It is also important for the country, since a dissatisfied administrative service can hardly be an effective instrument of plans for economic development and social change. That, of course, does not mean that a similar solicitude for the satisfaction for persons in other careers is not equally significant. It is and does need appropriate expression.

One can take an idealistic position regarding the importance of power, status or wealth but these cannot simply be wished away! One can also affirm that excellence in every assignment in any career is a reward in itself. At the same time, philosophical satisfaction of this sort cannot prove enduring unless accompanied by appropriate recognition, material compensation or incentives of other sorts. Motivation, even at the highest level, cannot be divorced from such mundane matters. Idealism should not degenerate into hypocrisy!

New criteria for a good administrator today is a subject which has received attention in India and elsewhere. The Fulton Committee Report, for example, has pointed out that the administrator of today cannot just be an "intelligent layman" but must specialize in specific fields of administration, like economic and social administration. He must also have special training in management and develop skills in numeric aids. At the same time, the importance of first-class university degree does not disappear, just because Macaulay is long dead. Ideas do survive their progenitors if they are potent. A first-rate academic performance, assuming, of course, that the examinations themselves are quite rigorous, is one of the objective indicators of an intelligent and versatile mind and, therefore, a dependable basis for recruitment to an administrative career. But this is not to deny the need for reinforcement of the latent faculties through a continuing process of training and development of talent.

—P. R. DUBHASHI

LETTER TO THE EDITOR

After going through the last Special Number of IJPA—containing articles nearly all of which deal with what Government and the country should do for science and scientist—one gets a feeling that our scientists and technologists are behaving like trade-unionists in presenting an ever-increasing charter of demands to Government and the country. The country, it appears, must pay through her nose to maintain these men or else they will drain out of India and give their services to that country which offers them the best wages. The emotion of patriotism seems to be only for the army and the civil services; for our scientists, considerations of self seem to rule uppermost.

A constant refrain in a number of articles is that scientists should participate in policy formulation and decision making. In our democratic system, Parliament is the supreme policy-formulating and decision-making body. It is not clear how scientists can participate in this without becoming members of Parliament. If our scientists have a wrong notion that the civil services lay down policies and take decisions they should be disabused of this notion. The role of the civil services happens to be to implement policies and decisions laid down by Parliament and the political executive but our scientists seem to resent being called in whenever they are required for the purpose of implementation of these policies. What alternative do they suggest?

It is not clear why, if scientists are clamouring for a role in policy formulation and decision making, they have not yet succeeded in evolving a machinery for formulation and overseeing of implementation of National Science Policy. Surely if "constitutionally timid ignoramuses" have stood in their way in achieving this, they could have worked out a blueprint for the purpose and put it up before the political executive for its approval. Their failure to achieve this basic minimum for success of science policy in India, indicates the bankruptcy of Indian science. The poor performance of the C.S.I.R. in promoting science for industry has been explained away in one article by the answer that scientists and science administrators were busy in expansion of laboratory facilities. I am inclined to agree with Dr. R. K. Vepa that a lot of second rate stuff is parading as Indian science.

In this context, I would like to make a few comments on the concepts of neutrality and anonymity of civil services. The concept of neutrality has of late come in for considerable criticism from responsible public men in the country. I feel that neutrality is a hideous word almost conveying the same meaning as the word sterility. The sooner we drop this notion, the better will it be for the virility of the services. As against neutrality, the concept of commitment has been suggested. The civil services have everything to gain by declaring that they are committed to achieve the goals laid down in the Constitution. As regards the concept of anonymity about the role of a civil servant as a District Officer

or as a Head of a Government department one may mention that the general public knows him as such and seeks his intervention in times of necessity. This is a role which calls for impartiality but not anonymity.

I, however, wish to suggest that a certain degree of freedom of speech should be given to the members of the civil services. By this I am not advocating that civil servants should use their freedom of speech to take part in political controversies. Neither am I suggesting that they should divulge State secrets in exercising their freedom of speech. In our times, one's survival seems to be directly related to the volume of noise one makes. In such ecological circumstances anonymity and lack of freedom of speech are operating manifestly to the detriment of the services. At the bar of public opinion in India and before the Administrative Reforms Commission the case of a generalist civil service has clearly gone by default. So religiously are we (the civil servants) hugging our anonymity that we are afraid even to whisper a word in defence. Surely the Indian public has a right to know the outstanding work done by Indian civil servants.

With the freedom of speech which I have in mind, I would suggest that the members of the services should take active part in educating public opinion regarding the role of a generalist civil servant. The controversy of 'generalist' *versus* 'specialist' is a futile one and will do more harm than good to the country. In the ever expanding functions, which the State is assuming, there is surely room for both the generalists and the specialists. The camel is a specialist of the desert but is awkward in the swamp. The hippopotamus, who is a specialist in the mud-lands, is helpless in the desert. It is only man, the generalist who is master of both the desert and the swamp.

—J. C. Pant
Deputy Commissioner
Rae Bareli (U.P.)

INSTITUTE NEWS

Shri Y. B. Chavan was unanimously re-elected President of the Institute, for the year 1969-70 at the Fifteenth Annual General Body Meeting of the Institute which was held on October 25, 1969. *Shri Ajoy Kumar Mukherjee*, Chief Minister of West Bengal, is the new Vice-President of the Institute for a period of two years. The following are the coopted members (for one year) of the Institute's Executive Council: *Shri B. Sivaraman*, ICS, *Shri Chandra Shekhar*, M.P., *Shri N. P. Sen*, *Shri Asoka Mehta*, M.P., and *Shri B. Venkatappiah.*

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During the two quarters (July-December) the Institute organized 12 courses for middle/senior level officials of the Central, State and Municipal Governments, Public Sector Undertakings, etc., on: Modern Aids to Management; Municipal Administration; Materials Planning; Development Administration (two courses); Appreciation Course on Techniques of Administrative Improvement (conducted in association with Department of Administrative Reforms, Union Ministry of Home Affairs); Budgeting and Financial Control; Performance Budgeting (two courses); Project Formulation; Administrative Behaviour; and Budgeting & Financial Management (this first out-station course was organized at Port Blair for training 27 senior officers of the Andaman and Nicobar Administration).

The Institute in cooperation with the National Academy of Administration (Mussoorie) also organized another Conference on Personnel Administration, at New Delhi from August 31—September 2. Sixty-five participants, who were M.Ps., Journalists, senior government officers from various services, business executives and academicians, discussed matters relating to effective implementation of ARC's recommendations on: (*i*) Staffing Policies, (*ii*) Unified Grading Structure, and (*iii*) Training and Development of Personnel.

In addition, two seminars were also held on "Cabinet System in Municipal Government" and "Unauthorized Construction"—in the latter Delhi Municipal Corporation collaborated.

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In the Institute's Faculty, the following new appointments were made: (*i*) *Dr. M. J. K. Thavaraj*, Professor of Financial Administration (Budgeting & Financial Management); (*ii*) *Shri B. S. Narula*, Professor of Public Administration (Administrative Theory and Behaviour); and (*iii*) *Dr. S. K. Goyal*, Reader and Head of the newly-created Industrial Administration Unit.

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In pursuance of the invitation of the Director of IIPA, for promoting "A Debate on the ARC proposals on Personnel" to create a favourable climate for implementing accepted recommendations of ARC Report on Personnel Administration, the IIPA regional/local branches organized the following: (*i*) *Seminar on Public Services in a Developing*

Democracy (Chandigarh, October 3-5); (*ii*) *Discussion on ARC Report on Personnel Administration* (Poona, October 9); and (*iii*) *Seminar on ARC Report on Personnel Administration* (Madras, October 11-12).

In addition, 12 lectures were also arranged under the auspices of regional/local branches of the Institute which include lectures on: (*i*) "Problems and Priorities of Development" by *Mrs. Vera Dean*, Professor of International Development, Graduate School of Public Administration, New York University; (*ii*) "The Contract Between Policy and Performance—Some Reflections" by *Dr. William H. Wriggins*, Professor in Government, Columbia University (U.S.A.); and (*iii*) "Criteria for Government Intervention in Industry" by *Mr. Maurice Zinkin*, Head of the Department of Economics & Statistics, Unilever Ltd., London. These three lectures were organized by Maharashtra Regional Branch at Bombay.

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IIPA's Centre for Training & Research in Municipal Administration brought out, in November, the inaugural issue of its quarterly journal *Nagarlok*. The new quarterly will cover municipal affairs exclusively.

The following new publications were brought out by the Institute: (*i*) *Relations Between Politicians and Administrators* by Prof. Shanti Kothari & Dr. Ramashray Roy (Rs. 20.00); (*ii*) *Citizen Administration and Lokpal* by Dr. V. Jagannadham & H. R. Makhija (Rs. 17.50); (*iii*) *Conference on Training* (contains proceedings of the Conference on the subject, held at IIPA, as well as papers contributed by the Training Division, Ministry of Home Affairs, and by some of the participants) (Rs. 25.00); (*iv*) *Five Year Municipal Development Plans* (proceedings of a seminar organized by IIPA's Municipal Centre) (Rs. 5.00); (*v*) *Citizens' Grievances and Administration* by Dr. A. P. Barnabas (Rs. 10.00); and (*vi*) *Administration of the Urban Fringe* (proceedings of the Seminar on the subject organized by IIPA last year) (Rs. 3.00).

Besides, Madras Regional Branch brought out the *Proceedings of the Seminar on Redressal of Public Grievances* which it conducted earlier. The copies of the proceedings were released by *Shri Ujjal Singh*, Governor of Tamil Nadu.

RECENT DEVELOPMENTS IN PUBLIC ADMINISTRATION

The Administrative Reforms Commission, besides the Report on Personnel Administration, submitted four more reports to the Government during the period April-December, 1969. These were on: (*i*) "Centre-State Relationships", (*ii*) "Delegation of Financial and Administrative Powers", (*iii*) Small Scale Sector, and (*iv*) State Administration, Digests of (*i*) and (*ii*) appear at pages 729 and 733 respectively.

A Policy Planning and Coordination Division has been set up in the Ministry of Information and Broadcasting to sift and analyse information and plan long-term strategy. It will also ensure inter-media coordination in the publicity effort of Government and undertake training and evaluation in the field.

The P & T Department has streamlined its organization for promptly redressing complaints of its clients. Officers to deal with complaints exclusively have been provided at headquarter, divisional and circle levels. The complaints cell in the P & T Directorate is headed by a full-time Director.

A separate department, called "Social Welfare Department", has been created by the Government of *Tamil Nadu*, to co-ordinate the various social welfare activities and to give an impetus to social welfare work. For similar reasons, the state government has also set up three separate Secretariat Departments for: (*i*) Industries, (*ii*) Labour, and (*iii*) Co-operation.

The National Commission on Labour has, in its Report, recommended setting up of permanent Industrial Relations Commissions both at the Centre and in the States and also Standing Labour Courts in the States.

It has urged immediate setting up of a Pay Commission to determine the wages and other conditions of service of government employees, and has suggested the following basis for promotions: (*i*) seniority at the lower rung; (*ii*) seniority-cum-merit at the middle rung, and (*iii*) merit alone at the higher managerial and technical administrative positions.

For effective participation of employees in the process of collective bargaining, it has recommended several measures for making trade unions well organized, strong and stable—such as compulsory registration of unions; raising membership fee as well as the minimum number of members required for forming a union; reducing number of outsider members, etc.

It exhorted greater respect to the principle of equal pay for equal work and, while recommending progressive increase in real wages, incentives and "fall-back-wages", it emphasised increase in productivity. It recommended a number of measures for making Wage Boards as an effective machinery for wage fixation.

It also suggested increase in absorption of women in skilled categories of work and that they should

nowhere be considered subordinate or secondary to men.

Following the recommendations of the National Commission on Labour, the Government of India has decided to appoint a new (third) Pay Commission to review the pay structure and other conditions of service of Central Government employees. Without having a sectoral approach in respect of departments or categories of Government employees, the new Pay Commission is expected to go into questions that may be referred to it in respect of Central Government employees as a whole.

The Government of *Tamil Nadu* has also appointed a Pay Commission (second) to consider revision of the pay scales and allowances of employees of the State Government, Local Bodies and teachers in aided institutions. The three-member Commission will be headed by *Shri F. Sivanandam*, now Chairman of the Tamil Nadu Public Service Commission.

The Government of *Uttar Pradesh* has set up a 7-member high power Committee on U.P. Civil Service (Executive Branch) (Chairman: *Shri J. D. Shukla*) to examine and report on matters relating to its existing strength, chances of promotion of its officers, and the necessity for posting them in different capacities in other government departments.

The Goverment of *Assam* has constituted a Police Commission (Chairman: *Shri Shanti Prasad*) to enquire into the organizational personnel and functional aspects of police administration in Assam. It will also cover relationship between Superintendent of Police and District Magistrate.

For improving the quality of training of I.A.S. probationers and making it more problem-oriented, a "sandwich pattern of training" has been introduced by Union Ministry of Home Affairs at the National Academy of Administration, Mussoorie, from July. The first spell (of 8 months) of training, at the Academy is for intensive training in subjects like Law, Economics, Political Theory, Constitution, Indian History and Culture; and after one year's on-the-job training in their States of allotment, the second spell (of 4 months) at the Academy is to be concentrated largely on the problems and techniques of administration and more practical aspects of Economics. Being problem-oriented, the latter would be based largely on their experience and observations in the field of district administration.

The Government of *Gujarat* has given gazetted status to all posts of Superintendents in the Subordinate Secretariat Service and other similar posts redesignating these as "Section Officer Class III" (with effect from May 17, 1969). The state Government has also curbed transferring powers of the concerned authorities to avoid unnecessary inconvenience and other domestic hardships to Class III and IV Government servants.

In pursuance of the recommendations of Gajendragadkar Commission regarding streamlining of appointments to the gazetted posts, the Government of *Jammu & Kashmir* has set up, for specific services, Departmental Promotion Committee to consider promotions to all gazetted posts/services. The recommendations of the Committee will be forwarded to the Public Service Commission for approval. The State Government has also decentralized recruitment to non-gazetted cadres. Three types of new cadres—one each for District, Division, and State—will be department based and comprise the

posts borne on the establishment of the three levels. The gazetted posts of these will remain under the purview of Public Service Commission, and maintained as State Cadres.

In order to improve the management of public sector undertakings, no officer of a Ministry will be appointed as chairman of a public sector undertaking or included in their boards of management, according to the decision of the Government of India. Further, each public enterprise will have a full-time chairman-cum-managing director or at least a full-time managing director.

In *Madhya Pradesh*, a directive issued by the Government enjoins upon its officers that they should not accept invitation for inaugurating any public function including those for opening of buildings, roads, bridges, public institutions, etc. Such functions should, in the view of the Government, be performed by non-officials. In *Haryana*, excepting the first official visit, no district officer is to wait on a Minister on tour in a district unless specially desired by the Minister. However, when Chief Minister visits district headquarters, the Deputy Commissioner and the Superintendent of Police would invariably meet him.

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A study team has been set up by the Government of *Punjab* to look into various problems concerning the development of the Panchayati Raj as well as the problems of animal husbandry and dairy farming.

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The Ministry of Irrigation and Power has set up a Committee of Central and State Ministers to suggest measures for accelerating the provision of the drinking water, irrigation and electricity in the Himalayan region. *Dr. Y. S. Parmar*, Chief Minister of Himachal Pradesh, will be the Chairman of this Committee. For a similar purpose Government of *Tamil Nadu* has also set up a Water Supply and Drainage Board.

The Old Age Pension Scheme, has now been revived by the *Haryana* Government keeping in view the hardships of the destitute old persons —unsupported-men of 65 and above and women of 60 and above. The rate of pension has also been enhanced from Rs. 15 p.m. to Rs. 25 p.m.

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As recommended by Gajendragadkar Commission, the Government of *Jammu & Kashmir* has set up a State Development Board to formulate long term proposals for the five-year and annual development plans of the State. Headed by the Chief Minister, it will also make recommendations regarding mobilization of resources for financing the development needs of the State.

An eight-member committee, with Finance Secretary as the Convener, has been constituted by the Government of *Madhya Pradesh* to ensure speedy implementation of Programme and Performance Budgeting in Governmental expenditure. As a first step, the works expenditure in the *Madhya Pradesh* State Budget of 1970-71 will be shown in accordance with this system.

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For promoting the development of a modern mechanised small scale sector, the administrative Reforms Commission has, in its Report on Small Scale Sector, proposed the constitution of a statutory high-power apex body to be called "the Small Scale Industries Commission"

to replace the present Small Scale Industries Board.

The Commission has also suggested creation of an apex investment and finance institution by a state with a paid up capital of Rs. 25 crores, besides making other important recommendations pertaining to: providing of technical advice and guidance in common basic trades and in industries with lower technologies; proper planning and developing of an industrial estate; training of its entrepreneurs and personnel; establishment of new management consultancy units; equitable distribution of scare raw materials between the large scale and the small scale sectors, based on the priority of the end-products, etc.

The Industrial Licensing Policy Committee of the Government of India, which enquired into working of the licensing system during 1956-66, recommended continuance of the licensing system in a much more rationalized and purposeful manner, and made several recommendations in this regard and also for improving organization of financial institutions. To prevent further concentration of economic power, the Committee recommended development of the 'Joint Sector', and participation of Government in the management of such crucial areas where funds are being provided in substantial proportions by public financial institutions and, sometimes directly by government. It confirmed that industrial houses, with assets exceeding Rs. 35 crores, had received a disproportionately large share of industrial licences, and undue preference in financial assistance from the specialized financial institutions during 1956-66.

By virtue of the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1969, which ratified the earlier Bank Nationalization Ordinance, 14 top Indian Commercial banks with deposits exceeding Rs. 50 crores were nationalized. The Act, provides for workers' participation in the management of these banks. Further, the Government of India has also set up a study group to examine various aspects of the idea of setting up a foreign Trade Bank of India to take over and run all the foreign branches of the public sector banks.

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The Law Commission, in its report on the Code of Criminal Procedure, has drafted a completely new Code consisting of about 480 sections as against the present 565 sections. Some of the more important recommendations of the Commission relate to separation of the Executive from the Judiciary in the administration of criminal justice; organizing all judicial magistrates—as class I and II (abolishing class III)—under a Chief Judicial Magistrate for each district under the control of High Court; and upgrading the status and widening range of functions of the Public Prosecutor of the district. It does not favour putting Executive Magistrates in two or three different classes according to their powers. The Commission is for continuance of the institution of Presidency Magistrates.

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With a view to fostering a co-ordinated democratic youth movement, the Government of *Mysore* constituted a Youth Welfare Board with the State Minister for Finance Planning & Youth Welfare, as the Chairman. A similar Youth Commission was also created in *Uttar Pradesh* with Chief Minister as its Chairman.

In order to gear educational administration to development needs, the Government of *Bihar* has constituted a 7-man Committee to examine the entire set-up of the State's Education Department. Similarly, the *Uttar Pradesh* Government reorganized its University Education Advisory Board to make it more plan oriented and has appointed a separate experts Committee to examine pattern of medical education. Another Committee appointed by the Government of *Assam* will, in addition to going into the problems of Secondary Education, examine the pay and service conditions of teachers in aided schools. Besides these, a permanent Urdu Board (Chairman: Chief Minister) has also been set in U.P. for development of Urdu language.

DIGEST OF REPORTS

INDIA, REPORT OF THE ADMINISTRATIVE REFORMS COMMISSION ON CENTRE-STATE RELATIONSHIPS, New Delhi, Government of India, 1969, pp. 54, Rs. 1.10

The Administrative Reforms Commission submitted its Report on Centre-State Relationships to the Government of India on June 19. The Commission was assisted in the work by a Study Team on the subject (Chairman: *Shri M. C. Setalvad*) which went into the different aspects of the subject. The important findings and recommendations of the Commission are as follows:

THE UNITY OF INDIA

(1) The basic constitutional fabric of the country is quite sound and must remain intact. The Constitution is flexible enough to ensure its successful working irrespective of whichever party may be in power and that it is not in the amendment of the Constitution that the solution of the problems of Centre-State relationships is to be sought but in the working of the provisions of the Constitution by all concerned in the spirit in which the founding fathers intended them to be worked.

ALLOCATION OF FUNCTIONS AND RESOURCES BETWEEN THE CENTRE AND THE STATE

(2) As recommended in the ARC Report on "Machinery of the Government of India and Its Procedures of Work", the role of the Centre in areas covered in the State List should be largely that of pioneer, guide, disseminator of information, and overall planner and evaluator. The functions of the Central Ministries and Departments with regard to subjects falling within the State List should be confined to the matters listed in paragraph 85 of that Report.

(3) [The Commission have already dealt, in their Report on the Machinery of the Government of India and Its Procedures of Work and the Report on Machinery for Planning, with matters relating to Central assistance, etc. Therefore, the Commission in this report were concerned with the following two connected problems: (*a*) the steps to be taken to deal with the problem of mounting debts of the States to the Centre, and (*b*) the need for pre-determination of the principles on the basis of which grants should be given for Plan schemes.]

(*i*) Loan for Plan schemes should be given only when they are of a productive type. Whether a scheme is productive or not, should be decided by the Planning Commission in consultation with the Finance Ministry and other Central Ministries concerned.

(*ii*) The repayment of productive loans should be made over a period of time, the States endeavouring to maximize the return on the investments and building up sinking funds for amortization of loans. The timely payment of a proper rate of interest should be insisted upon.

(*iii*) Assistance for non-productive capital schemes should be in the form of capital grants.

(*iv*) The problem of dealing with outstanding Central loans to the States for Plan schemes, as also the question of setting up of sinking fund for the amortization of debt, should be referred to a committee of experts.

(4) When the Constitution was framed recourse to its Article 282 for the purpose of making grants for the Five Year Plan schemes could not have been contemplated. Hence, the Finance Commission may be asked to make recommendations on the principles which should govern the distribution of Plan grants to the States. The appointment of the Finance Commission may be so timed that when making its recommendations it will have before it an outline of the five Year Plan as prepared by the Planning Commission.

The application of the principles governing the distribution of Plan grants from year to year will be left to the Planning Commission.

In order to secure effective co-ordination of the Finance Commission's recommendation and the Plan, a Member of the Planning Commission may be appointed to the Finance Commission.

The Finance Commission should include two persons, one having experience of financial administration at the Centre and the other having such experience in a State.

The Unit of the Plan Finance Division of the Ministry of Finance at the Centre may be strengthened. It should form the nucleus of the Finance Commission's secretariat from time to time.

(5) The Finance Commission should take into consideration the problem of granting increased emoluments to the State Government employees on account of increase in the cost of living, while making allocations of resources to the States.

(6) The State Governments should adequately tax the direct beneficiaries of the heavy investments in big projects like the Irrigation and Power projects.

ROLE OF THE GOVERNOR

(7) A person to be appointed as a Governor should be one who has had a long experience in public life and administration and can be trusted to rise above party prejudices and predilections. He should not be eligible for further appointment as a Governor after the completion of his term. Judges, on retirement, should not be appointed as Governors. However, a Judge who enters public life on retirement and becomes a legislator or holds an elective office may not be considered ineligible for appointment as Governor.

(8) The convention of consulting the Chief Minister before appointing a Governor is a healthy one and may continue.

(9) Guidelines on the manner in which discretionary powers should be exercised by the Governors should be formulated by the Inter-State Council and on acceptance by the Union issued in the name of the President. They should be placed before both Houses of Parliament.

(10) The Governor, besides sending the fortnightly reports to the President, should make *ad hoc* reports as and when the need arises. He must act according to his own judgement and discretion in making such reports to the President and also in regard to the reservation of Bills for the consideration of the President.

(11) When the Governor has reason to believe that the Ministry has ceased to command a majority in the Assembly, he should come to a final conclusion on this question by summoning the Assembly and ascertaining its verdict on the support enjoyed by the Ministry. When a question arises as to whether the Council of Ministers enjoys the confidence of the majority in the Assembly, and the Chief Minister does not advise the Governor to summon the Assembly, the Governor may, if he thinks fit, *suo motu* summon the Assembly for the purpose of obtaining its verdict on the question.

(12) Where functionaries like the Speaker act arbitrarily and prevent the functioning of legislatures, effective remedies must be devised by the legislatures themselves by way of formulating rules of business which would enable the legislature to transact the business for which it was called into session.

(13) When a Ministry is defeated in the Assembly on a major policy issue and if the outgoing Chief Minister advises the Governor to dissolve the Assembly with a view to obtaining the verdict of the electorate, the Governor should accept the advice. In other cases, he may exercise his discretion.

(14) The Governor should not only receive information as provided for in Article 167, but should also actively look for it with a view to discharging his Constitutional responsibilities effectively.

INTER-STATE COUNCIL AND INTER-STATE WATER DISPUTES

(15) Centre-State and inter-State differences should not be discussed in public as it does often rouse or even inflame public opinion. Such differences should be settled by mutual discussions. To the extent possible, these discussions should be held in camera. Only the decisions may be issued in the form of Statements.

(16) An Inter-State Council should be constituted under Article 263 of the Constitution. It may consist of: (*i*) the Prime Minister (Chairman); (*ii*) the Finance Minister; (*iii*) the Home Minister; (*iv*) the Leader of the Opposition in the Lok Sabha (when one is not available, a representative should be elected by the Opposition parties by single transferable vote), and (*v*) five representatives, one each from the five Zonal Councils. Any of the Union Cabinet Ministers or Chief Ministers who may be concerned with a particular subject, may be invited for discussion when the relevant subject is under consideration.

The proceedings of this Council must be secret.

(17) (*i*) The functions of the Inter-State Council should be as indicated in Article 263 of the Constitution, *i.e.*, (*a*) inquiring into or advising upon disputes which may have arisen between States; (*b*) investigating and discussing subjects in which some or all of the States, or the Union and one or more of the States have a common interest; or (*c*) making recommendations upon any such subject and in particular, recommendations for the better co-ordination of policy and action with respect to that subject.

However, the Inter-State Council need not deal with matters within the purview of the National Development Council and such matters as the Prime Minister may decide to refer to the full-fledged Chief Ministers' Conference. Matters which can more appropriately be discussed in *ad hoc* conferences of Ministers, *e.g.*, Food Ministers' Conference,

Education Ministers' Conference, may also not come up before the Council.

(*ii*) The Inter-State Council may be set up, to begin with, for a period of two years. A decision may be taken on its continuance in the light of experience gained.

(18) A time limit of three years may be prescribed for settlement by mediation of any Inter-State water dispute reckoning from the date the dispute first arises and on the expiry of the time limit the dispute shall be referred to compulsory arbitration by a tribunal.

LAW AND ORDER

(19) (*i*) The use of the naval, military or air force or any other armed forces of the Union in aid of civil power of a State may be made either at the instance of the State Government or *suo motu* by the Centre. The question whether such aid is needed must obviously be a matter of judgement by the Centre. This is also consistent with Article 355 of the Constitution. The intervention of the Centre in aid of the civil power on its initiative cannot be restricted to a threatened emergency under Article 352.

(*ii*) The Centre may exercise its discretion to locate the needed forces in the States and to deploy them for maintaining public order for purposes of the Centre, such as protection of central property, central staff, and works in which the Centre has an interest.

(20) The issue of direction by the Centre to a State should be the last step. They, therefore, recommended that before issue of directions to a State under Article 256 the Centre should explore the possibilities of settling points of conflict by all other available means.

SOME IMPORTANT INSTITUTIONS HAVING A BEARING ON CENTRE-STATE RELATIONSHIPS

(21) It is not necessary to restrict the role of State Governments in the matter of selection of High Court Judges. The present procedure and method of appointment of High Court Judges has worked satisfactorily on the whole and should continue with the modification that the role of the Ministry of Home Affairs may be taken over by the Ministry of Law.

(The Commission does not favour the Study Team's proposal that one-third of the Judges may be selected from 'outside' the State. In this connection, they observed that keeping in view the pressures now being built up in the States that the courts should adopt regional languages and that Hindi should be the language of the Supreme Court, it may not be possible to enforce the recommendation of Study Team when different High Courts use different languages.)

DECENTRALIZATION OF POWERS IN CERTAIN AREAS

(22) A constant source of irritation in the relations between the Centre and the States is the need for the States to obtain 'clearance' from the Centre for action required to be taken from time to time on projects which are financed by the Centre or are carried out by them as agents of the Centre. Powers should, therefore, be delegated to the maximum extent to the States with regard to their work on projects in which the Centre is directly interested or which are carried out by them as agents of the Central Government.

INDIA, REPORT OF THE ADMINISTRATIVE REFORMS COMMISSION ON DELEGATION OF FINANCIAL AND ADMINISTRATIVE POWERS, New Delhi, Government of India, 1969, pp. 26, Rs. 1.20

The important findings and recommendations made by the Administrative Reforms Commission in the report are as follows:

(1) (*i*) Speedy decision-making is the essence of efficient administration in a big and complex organization like that of the Government where a large number of decisions are to be taken from time to time. Therefore, to avoid bottlenecks, delegations of powers on a large scale is inescapable. In making delegations the approach should, therefore, be that powers to be delegated should be the "maximum possible" in the circumstances rather than the "minimum necessary". (*ii*) Such delegations should be reviewed at periodical intervals in the light of the requirements of the changed circumstances in which powers are exercised. The Department of Administrative Reforms should assist the nodal and other Ministries concerned in making such a review and formulating proposals for changes necessary in the delegations, for the consideration and decision by Government. (*iii*) Further, whenever any modifications or changes have to be made in the delegations, these should be done through amendments to the rules themselves and not through executive instructions.

Exercise of Delegated Powers

(2) To ensure that the tendency to push up decision-making to higher level is checked properly, (*i*) the higher authorities should exercise restraint and discrimination in calling for information on matters which are the subject matter of exercise of powers delegated to subordinate authorities. (*ii*) Senior managers should organize their work in such a way that they do not handle tasks which should be left to those who are working under them. (*iii*) Senior managers should make it a part of their duty consciously to encourage and train those functioning at lower levels to develop initiative and habits of decision-making on their own.

(3) (*i*) The delegating authority should be responsible for ensuring that powers are properly exercised by its subordinate agencies. For this purpose, it should organize on-the-spot inspections and scrutiny of periodical returns containing details regarding decisions taken by delegatee authorities.

(*ii*) In judging the manner in which delegated powers are exercised, a broad view should be taken. Petty mistakes or minor errors of judgement should not be made much of and one who has shown initiative and boldness in taking decisions should be encouraged notwithstanding minor errors.

DELEGATIONS IN RELATION TO FINANCIAL POWERS INCLUDING BUDGET

(4) While the responsibility of the Finance Ministry for budget-making and for pre-budget scrutiny should remain unimpaired, ways and means should be devised by mutual cooperation between the administrative ministries and the Finance Ministry to avoid as far as possible duplication of work in the matter of budget scrutiny.

(5) In order to ensure that the delegation of financial powers does not become ineffective due to the widespread existence of two interrelated practices of including the lumpsum provisions in the budget estimates or accepting estimates subject to the post-budget scrutiny, the Finance Ministry should initiate

a joint programme for the improvement of budget procedure in collaboration with the administrative ministries and the Comptroller and Auditor General, with a view to spacing out the budget proposals during the year and avoiding rushing them at the very end of it.

(6) Subject to necessary safeguards, the ministries should delegate adequate financial powers to the Line and Specialist Organizations. The delegations should generally be related to the nature of work handled in such organizations. This should be achieved mainly by suitable adjustments in the delegation of powers of the existing categories of authorities. An increase in the number of patterns themselves should be considered only if unavoidably necessary. Care should, however, be taken to ensure that there is no needless proliferation of patterns.

(7) In view of the importance of adequate arrangements for the good financial management as an accompaniment of, or a pre-requisite to, the delegation of powers, the feasibility of having an internal Finance Officer in selected Line and Specialist Organizations should be examined and such an officer should be appointed wherever the nature or the volume of work clearly warrants such an appointment.

DELEGATIONS OF ADMINISTRATIVE POWERS

(8) There should be a personnel cell in important viable line and specialist organizations to deal with the work relating to personnel administration and ensure careful exercise of powers in the delegated fields.

(9) While it would not be expedient to vest discretion in the heads of organizations to re-delegate all their powers, the administrative ministries should consider it a part of their duty to foster and develop decision-making, initiative and action at the lower levels. Heads of Organizations should be empowered to re-delegate, with the approval of the ministries, some of their administrative powers to the officers within the organizations. The re-delegations should be subject to periodic review and, where found necessary, suitable amendments should be made in the light of the experience gained.

RULES AND REGULATIONS HAVING A BEARING ON DELEGATIONS

There is lack of proper arrangements for keeping up-to-date the manuals and regulations regarding financial matters and service conditions. No single authority is charged with the duty of compiling, and keeping up-to-date, the existing rules and regulations, arranging for their periodical reprint, and for the issue, from time to time, of correction slips for the use of officials administering these rules.

A central agency should specifically be entrusted with the multifarious duties relating to these rules. All rules and regulations having a financial bearing may be entrusted to a cell in the Finance Ministry. Rules relating to personnel administration as such, may be entrusted to a cell in the new Department of Personnel already recommended by the Commission in their Report on the Machinery of Government of India and Its Procedures of Work.

BOOK REVIEWS

DEMOCRACY IN THE ADMINISTRATIVE STATE; By EMMETTE S. REDFORD, New York, Oxford University Press, 1969, pp. 211.

One who is familiar with the writings of Professor Redford will open the book with anticipation and close it with a feeling of satisfaction for being served a rich dish of intellectual diet. Professor Redford turns his attention in the book under review to discussing the relationship between democracy and the administrative structure that inevitably comes into being to implement the concerns of democracy. To be more precise, the theoretical focus around which analysis in the book is organized pertains to the question as how "to reconcile the practice of effective democracy with the positive and energetic public administration required by the modern state".

The modern state is characterized by the increasing complexity of governmental functions as well as the size of these functions. Moreover, due to the operation of certain factors the government has not only to continue certain services provided to the public but also to create and undertake new functions necessary for security and welfare of the public.

This has necessarily meant the emergence of complex organizations —both public and private—whose decisions affect the pattern of distribution of benefits. In the context of the inevitability of the administrative system and the various ways in which it affects the lives of citizens, Professor Redford explores the existence (or non-existence) and the possibilities for achievement of democracy through the operations of the administrative state and the influences upon it.

This exploration takes Professor Redford to investigate the basic tenets of democratic morality which he identifies as individual realization, equality of men in their claims for attention, and participation either directly or through control of leaders —as the instrument of implementation of substantive values. However, obstructions to the realization of these tenets in real life are manifold and their sources multiple. Nor can the democratic—for that matter, any—political system ever remove these obstructions completely. For instance, law cannot take care of the individual's internal conditions nor can it create and regulate conditions that vitiate perfect equality and equal participation.

Professor Redford then goes on to examine the natural, regular, and persistent factors in the operation of public administrative institutions and their implications for realization of the democratic ideal. Examining in detail the institutional aspects of administrative structures, the role of individuals, and the interactive processes between administrative structures and individual roles, he demonstrates that policies are made by interactions of men occupying strategic positions in specialized institutions. The diversity of institutional structures, official roles, personal

stakes and professional orientations counteract the tendency towards concentration of power and decision-making. The dispersal of power as well as the participation, either direct or indirect, in decision-making processes by power brokers, opinion makers, non-leaders and others makes for a search for consensus and reconciliation of claims.

Turning his attention to sketching the American national administrative system, Professor Redford locates the strategic centres of influence, describes the effects of their interactions and demonstrates their implications for democratic morality. His analysis brings out some important features of the structure and function of administrative system. He observes, for example, that administrative relations are multi-dimensional and involve coordination and channeling of influence through several points both political and administrative. Professor Redford also delineates the ways in which macro—as well as micro—political systems impinge on the administrative structure and influence administrative decision-making processes. The macro-system, that is, the legislative and the executive branches, frames rules which guide the functioning of the administrative system and through frequent reviews of administrative performance functions as a control mechanism.

The interrelationship between the administrative structure, the micro-system and the macro-system is very complex and multi-dimensional. The contact points between these different structures serve as communication linkages as well as channels of influence. Another crucial feature pertains to the plurality of the sources of pressures on the administrative structures and the utilization of various kinds of influence structures for the fulfilment of demands channeled into the administrative system. The conflicting nature of claims and demands on the administrative system transforms it into a system that functions essentially through processing these conflicting claims, reconciling them and forging a consensus that can provide a viable basis of effective decision-making. Moreover, in a functioning democracy administrative structure is characterized by its porousness, that is, influences and pressures can be brought to bear on it from above, sides, and below. All these factors make for administrative responsiveness and responsibility. It should, however, be emphasized that whether or not the administrative system manifests the attributes of responsiveness and responsibility depends also on the degree to which the macro-political system is itself representative and effective in its operations.

In addition to the fact that the administrative system impinges upon the lives of its clientele, it has also considerable influence over the lives of its employees. Professor Redford rightly includes this aspect in his discussion. While organizations provide work, they can also be harsh. Various approaches, such as, authoritarianism, guildism, and human relations, prescribe the ways in which workers' interests can be protected. However, as Professor Redford demonstrates, they have their own shortcomings which prevent each of them from being completely effective. Professor Redford, therefore, suggests a fourth approach—liberal constitutionalism—which contemplates legal definition of the rights of and limitations on the parties in the employment relationship.

There is no doubt that Professor Redford brings to bear on the problem his vast scholarship and sharp analytical skill. However, a few

deficiencies in an otherwise closely reasoned analysis must be noted. In the first place, it is unfortunate that Professor Redford restricts his analysis to American experience. This has prevented him from discussing the salience of cultural context for administrative system.

This omission is unfortunate because cultural differences have an important bearing on the functioning of administrative systems in different climes. In the second place, the analysis presented in the book seems to be overly influenced by group theory of politics. It is not valid to argue that political or administrative decisions are the resultant of the conflict between various organized interest groups. Nor, all countries have as yet developed a structure of pressure groups as in America. Further, even if we recognize the crucial role played by the conflict between pressure groups in political decision-making, what happens to those interests which are unorganized or cannot find a protector and promoter? And, lastly, if a representative and effective macro-political system is a necessary condition for making administrative system responsive and responsible, what happens when a country, particularly a developing country, does not have a well-stabilized democratic political system? Clearly, the American experience does not become fully relevant for such countries. In short, then, the lack of a comparative perspective robes much of the usefulness of the book under review.

—Ramashray Roy

STATESMEN IN DISGUISE: THE CHANGING ROLE OF THE ADMINISTRATIVE CLASS OF THE BRITISH HOME CIVIL SERVICE; 1853-1966; By Geoffrey Kingdon Fry, London, Macmilan & Co. Ltd., 1969, pp. 479.

The book under review is an enlarged version of the author's doctoral dissertation submitted to the University of London in 1967. At a time when many students of Public Administration in England were very much concerned with the deteriorating performance of the British Civil Service, particularly of its Administrative Class (which according to many had remained stagnated in its functions since its inception in 1853), and were advocating drastic "modernization" of its role and structure to suit the changed conditions, Dr. Fry's study could not have been more topical and significant. The fact that the book came out after the much awaited Fulton Committee verdict on the reorganization of the British Civil Service had been discussed and debated in the press, in the Parliament, and in the academic and professional circles, has provided an additional opportunity to the author to re-evaluate his conclusions against the backdrop of Fulton Committee's proposals. The author has thus attempted to survey the development of the role of the Administrative Class personnel in the British Civil Service up to 1966, and to look forward to its possible development in the light of the Fulton Report.

Dr. Fry builds up his thesis against the historical perspective of the development of the Administrative Class since 1853 (such a perspective he thinks is lacking in the Fulton Report, p. 365). He concludes that the Administrative Class's ideal administrator—a direct descendent of the "intellectual class" envisaged in the Northcote Trevlyan Report of 1853—basically remains the same "intelligent layman", who sees his

special role as "the awareness of Ministerial responsibility". This theme which he admirably develops in his first chapter amply justifies the title of the book "Statesmen in Disguise". This conventional role, the author concludes, "is now outmoded" and the Administrative Class "would need to learn more in the future in the direction of technocracy". "The all rounder tradition of the Administrative Class, its tendencies of low valuation to management, specialized knowledge and investigation as preliminary to action," constitutes according to him, attitudes more appropriate to the service of a Regulatory State than that charged with administering the welfare State and of managing its economy. The remedy, according to him, lies in a radical recasting of the Civil Service with the initial step in the process of abolition of the separate Administrative Class, and the merger of the Executive and the Administrative Classes on the basis of a more specialized career structure—the leading grades of the merged class, together with the equivalent grades of the specialist groups forming an integrated Higher Civil Service. In his subsequent chapters, he further examines the impact of the Positive State on the direct entry recruitment and post-entry training arrangements of the Administrative Class, and the relationships of that class with the managerial Executive Class, and the leading specialists groups. These chapters have a special value for the readers who wish to acquaint themselves with the large amount of source material that exists on the methods of recruitment and training of the British Civil Service. The author thus comes to the conclusion that a more unified Higher Civil Service would provide the type of administrators needed by the modern state. With an open hierarchy, the service should be able to exchange staff with the local authorities, the public corporations, private industrial and commercial undertakings, and the Universities on a larger scale than at present. The study ends with a post-script relating to the author's review and reassessment of the Fulton Report and its recommendations on the reorganization of the British Civil Service.

To a distant observer, the conclusions may not seem to be too formidable or significant in relation to the vast and exhaustive material that the author had the opportunity to examine for establishing his case. To certain extent similar steps as suggested by the author had already been taken in the British Diplomatic Service (re-organized on the pattern of uniformed grade structure after the Plowden Report of 1964). The extension of these moves into the Home Civil Service was more or less anticipated in the Fulton Committee Report as a logical sequence of such development. The author's originality, however, lies in the fact that he has attempted to evaluate the existing structure of the civil service in terms of the changing and growing needs of the society and the requirements of a Positive State. He advocates the amalgamation of the Administrative and Executive on a rational basis—*viz.*, as a symbol of class distinction with the civil service. In other words where the Plowden Report (on the British Foreign Service) failed was in its veiled attempt to maintain class distinction within a unified Diplomatic Service, while Dr. Fry rightly pleads for total and real breakdown of such barriers.

The concluding chapter of the book (pp. 251-360) seems to have been greatly supplemented with the new material that had come to light immediately after the author had completed his doctoral dissertation. Such material was produced to be

received as evidence for the guidance of the Fulton Committee deliberations. One of the initial themes discussed in the conclusion is the very complex problem of the proper relationship between the Ministers, civil servants and the experts, having its bearing on the concept of nutrality and anonymity of the civil servants—a problem which he rightly thinks has not received adequate attention in the Fulton Report. However, instead of arriving at some far-reaching conclusion, as one hoped he does not go any farther than an implicit support for the Labour Party's proposal of creating "posts of confidence" for the help of Ministers, which in itself is quite controversial. Another theme discussed at length in the concluding chapter is the "Training of the Civil Servants". Here again he merely examines in detail the proposals of the Report of the Working Party of Her Majesty's Treasury on Management Training (1967), and in doing so missed an opportunity for presenting a scheme for the Training of the re-organized service as would suit the demands of the contemporary welfare state. Yet another theme on the system of Personnel Management and Recruitment for the Unified Civil Service is likewise sketchly discussed in the concluding chapter.

The post-script of the book contains Dr. Fry's assessment of the Fulton Report and its various recommendations on the Civil Service. While conceding that reasonable people might differ on the problems of the British Civil Service, his analysis appears to be not adequately objective at many places. To mention one example, Fulton's proposal for a separate Civil Service Department, regarded by the author as "ill-considered" is indeed the vindication of the growing realization that personnel management is a distinct and direct responsibility of the Chief Executive in any organization, which could no longer be muddled through the financial transactions, nor be left to be bogged down under a traditional, negative and static outlook.

Nevertheless, the book is an accomplishment of a stupendous task on the part of the author inasmuch as he presents an impressive survey of the British Civil Service. His use of the primary and secondary sources is judicious and effective, which he has further supplemented with the oral and written evidences of the persons in and outside the civil service. Despite the frequent long quotations of texts from numerous reports and books, inevitable in a work of this kind, the author's painstaking efforts and judgement compel admiration, for he does establish the main points of his thesis convincingly. To a research scholar on the British Civil Service, the appendices containing some important statistical data and the Bibliography at the end of the book should prove to be highly useful—indeed inavoidable!

—R. B. JAIN

PANCHAYATI RAJ AND BUREAUCRACY: A STUDY OF THE RELATIONSHIP PATTERNS; By V. R. GAIKWAD, Hyderabad National Institute of Community Development, 1969, pp. 77, Rs. 10.00.

Next only perhaps to the *Das Kapital* and the Shakespearean plays, panchayati raj in India has been the pet theme for researchers and commentators. On the recommendations of the Balwantrai Mehta study team, panchayati raj was inaugurated with much fanfare as a system of

Local self-government that would usher in both democracy and development in rural India. In course of operations, the new system naturally developed stresses and strains which belied the hopes of many an optimist. Although in terms of sheer quantity, researches into panchayati raj are bewilderingly numerous; but to the discriminating eye, very few of them would pass for real 'research'. It is heartening to note that the work under review can certainly claim a place among the selected few.

This research work concentrates on a specific aspect of panchayati raj, *viz.*, the relationship between the non-officials and the officials, which has earned a notoriety for giving rise to stresses in the administrative system. Based on a micro-study of the interaction pattern between the two arms of panchayati raj in a zilla parishad in Maharashtra, it has tried to find out the actual areas of conflict and cooperation between the two sets of actors. Instead of relying merely on structural-institutional factors and forces, the author has successfully delved into the behavioural realm which serves as the matrix of ideas and attitudes and explicit relations in the form of conflict, competition and cooperation. A remarkable feature of this study is the elaboration of the areas of differentiation between the non-officials and the officials, such as educational achievements, social background, and economic and occupational background. Very often, the tensions between these two wings are glibly attributed to formal-legal situations. For instance, recurring conflicts between the deliberative and the executive wings in the municipal corporations have frequently been stated to be due to the statutory separation of powers between the two. But, as this research work has revealed, "Many of the conflicting situations observed and studied show that their basis was essentially of socio-psychological nature. The question of power prerogatives seems to have its origin in and is the reflection of such an atmosphere where the clashes especially at the higher echelons of district administration are the outcome of conflicting self-images of the individuals involved.' Insofar as this study has been able to successfully explore the socio-psychological hinterland of local public administration, it has added a new dimension to the arid, formalistic research in public administration.

By way of criticism, it may be said that despite the meticulous gathering of comparable data on the socio-economic background of both the non-officials and the officials, the correlations between the variables and the conflict situations have not been clearly established. Also, it would have been better to check the temptation to make a sweeping statement at page 67 on "the general condition prevailing in the administrative set-up in the country".

Methodologically, this research piece deserves attention because of the efficient use of the method of participant observation supplemented by informal, unstructured interview technique. It has well demonstrated how methodology can be more than a jargon and really useful in scientifically organizing a research work. One would expect that such micro-studies would be conducted more extensively both in urban and rural local governments to facilitate the formulation of general propositions about the operations of local government.

—MOHIT BHATTACHARYA

NAGALAND NIGHTMARE; By P. D. STRACEY, Bombay, Allied ?ublishers, 1968, pp. 319, Rs. 25.

'Nagaland Nightmare' is essentially ın administrators analysis of the ›olitical developments in Nagaland luring the last 10 years. Stracey lid not have an intimate knowledge ıf the undercurrents of Naga poliical moves till he was posted at Kohima in 1963 but he had adeuate knowledge of the Naga characer or personality because of his aving to deal with the Naga Hill)istricts as Chief Conservator of 'orests of Assam of which Naga Iills District was a part. With this ackground Stracey is adequately ualified to write on Nagaland—ext probably only to a Chief Secreıry or a D.C. if he was to write such book.

Why has Stracey called the book Nagaland Nightmare"? Experienes vary and while some are lucky to perience affairs which encourage ɔtimism others are unfortunate and ›mpelled to look at things with pesmism. While Stracey's pessimism regards the political solution of the agaland problem might be shared several, his pessimism with regard administration will not be shared many now. Of course allowance ıs to be made for the continued ace for three more years since racey retired. During these 3 years e State Government which to quote racey is considered by underounds and Peace Mission only a 'aretaker Government' has gained eater confidence in itself and has gun to assert, as a rightful Governent of Nagas (a belief reinforced by st General Elections in which a party pported by undergrounds is also ated to have contested). Secondly, th the establishment of such overnment the rank and file of adinistrators have also learnt to work e machine more in accordance with e rule of Law and not dictates of their tribal loyalties or not always anticipating what its reaction will be on the under-ground element, except where any action is to endanger their personal security. It will be an exaggeration to say that the administrative behaviour, attitudes and knowledge of the rank and file of administrators in Nagaland has now attained a stage of maturity similar to other States, and they can be as apolitical as their counterparts elsewhere, but it is quite safe to say that there is a trend towards that stage. Moreover, it is not only the change in the outlook and performance of the administrative machine that is material but also a change in the outlook of those who hitherto were either apathetic or ignorant of the role of the administrators. The Members of the Legislative Assembly, for instance, now expect the officers and their men to operate the administrative machine in the same fashion as in other States and this is an encouraging sign.

Stracey has very ably portrayed the Naga character—an understanding of which is essential for both political solution and administrative improvements. He praises Nagas for "The free and independent outlook and their men to men attitude on most questions", "reputation for truthfulness and honesty" and "the Naga oneness". "Once they have no more use for a person and have secured a tactical advantageous position, or sense danger, they never hesitate to act even though it smacks of callousness. In these respects they are to be both admired and feared". "Sentiments played little part in their make up." "Naga was a good chap with a free and independent outlook, scornful of control and impatient of criticism; a generally fine physical specimen capable of

great endurance and exertion and an industrious worker in his field; truthful and honest when compared to average standards and with a man to man attitude; quick to respond to sympathetic personal handling and leadership; a person with an ingrained sense of humour which could be relied upon to rise to a funny or comic situation". "Naga is not wanting in political sagacity and sound commonsense." "A unique combination of characteristics; an acute sense of oneness stemming from a highly democratic system, an innate stubbornness amounting to obstinacy, a high degree of intelligence which is concealed under an unimpressive surface, a shrewd cunning which hides behind a cheerful grin and a political maturity for which the average person does not give the sufficient credit."

On the other hand Stracey also refers to "general Naga stubbornness in matters involving broader interests of their people". He is critical of them because "Naga is basically a reticent individual, rather suspicious of strangers and inclined to be on the defensive", "he is very sensitive to correction and wants to be taken seriously at all times, he has a streek of great stubbornness in him particularly when he has set his heart on something which makes him a difficult person to handle; that while his output of work can be high he is not very reliable and that he has his own ideas of what should be done and how it should be done." "There is a certain similarity between Naga (personality) and form: under an attractive, external openness an inscrutable depth, a group solidarity a stubborn persistence, a pulsating repetitiveness."

In relation to the administrative environment and behaviour of Government servants Stracey observes, "There was a certain strong personal interference in the control over the working of every department". "Within the seeming 'one big family' atmosphere there was an inner Naga oriented policy which we had to follow willy nilly." "Conditions in Nagaland were not yet ready for direct administration." "There was an omen of unreality if not worse about the (officials)." "Obsessed by the otherwise admirable feeling that their first duty was to the people under their charge and vested with almost limitless authority, they tended on the one hand to make the rules as they went along; on the other hand unable to free themselves, in some cases of career considerations and in the case of local men, tribal ties, they tended to go with the tide unless they were of unusual mettle."

These traits are not, however, unchangeable and as Stracey has himself pointed out through the utterances of some persons, some change in their personality was already noticeable. It should not be forgotten that some of the characteristics of Nagas are acquired characteristics created as a result of tensions during the Second World War and the subsequent underground activities. With political stability there is bound to be relaxation. In respect of the attitudes of Government servants and the administrative environment Stracey seems to have particularly felt frustrated but such frustrations may not remain for long as administration comes closer to Nagas, and more and more Nagas themselves get involved in administration either as political chiefs or as officers. Stracey has himself in a different context pointed out "In recent years many tribal people have been taken in (IFAS) by direct recruitment and by promotion and if the quality has suffered to some extent that is made up by a greater sense of affinity with the tribal people under them". No doubt as again pointed out by Stracey "the danger is that a frontier

administration is likely to become excessively committed in respect his charge and to develop a closed mind". But there are situations which have been faced in other States also and the corrective of adequate mixture of outside persons in the various ladders of services can with profit be applied in Nagaland also.

Stracey has also presented brilliantly the administrative set-up prevailing before the advent of independence and its effect. To quote Stracey "The British left the tribal people very much to themselves and *ruled them with light hand. It did* not pay them to organize an elaborate administrative machinery for the hills were largely unproductive and were even then a financial liability ... the word of the hill administrator was law to the simple tribesman, who in turn was 'a good fellow' to his master." "They did not post Indians to the Hill districts and encouraged the Sahib type of administrator to remain as long as possible in one station". This isolation to quote Stracey again "had a subtle effect on the psychology and general outlook of both rulers and ruled. This was visible to any discerning person. In the case of Nagas it can be said to have spoilt an already strong willed people for Indian citizenship." The advent of freedom has no doubt brought tremendous changes in the relationship between the ruler and the ruled. European and Anglo Indian officers for whom Nagas had a special liking on account of past good associations have been replaced by 'black Indians' who in the past were known to Nagas or were so presented only as tricky plainsmen. This has naturally created more suspicion in their minds. But the countervailing factor is that after Independence and with the ushering in of a programme of development highly professional people have also come from plains whose services have also been recognized by the local people. It is as impossible now to run administration in Nagaland in the fashion in which a few D.Cs. ruled in Naga Hills in the former days—as it is impossible for the Nagas to revert back to their old way of living. The Nagas also have now better understanding of the people in the plains—they themselves having been educated in the plains. A new relationship of the ruler and the ruled is therefore being produced which given the political stability will assume a pattern more or less similar to other States. Stracey is therefore *wrong when he* jumps to the conclusion: "Thirty years before, the Naga was like that snake full of spirit and aggressive but severely held in the firm British grip; now in the crisis of the struggle for independence from weak India the same people still impressive but elusive and with a determination to escape like this snake". The following observation of S.E. Peel "(Nagas) *need an intel*ligent chief over them—one not changed for every little frivolous pretext, but one who will elect to live among them and work for them" however still commends itself as a corrective to the present thinking on administration in Nagaland.

Stracey has very correctly exposed some of the myths prevailing in the rest of the country about the possible solutions to Nagaland's political problem—such as 'give the army a free hand and they would solve the matter in no time' or "to enforce security in the villages, isolate loyal villages from the hostiles", "the villages should be regrouped". Anyone who has spent a reasonable amount of time in Nagaland would realize the futility of these schemes. Both of these measures can be implemented but with disastrous results. At the same time Stracey has also conclusively and convincingly exposed the recalcitrance of the die hard among

the underground to come to any reasonable settlement within the Indian Union. His narration of the political dialogues held with the underground by various agencies clearly establishes that each time a concession was made to the underground, they came up with another demand and when they were beaten out in political negotiation, they just avoided reaching a settlement on some pretext or the other. Fortunately, a moderate group has emerged among the undergrounds who are rallying round the view point that Government of India has gone farthest that it could go and that the solution of the problem lies only in remaining within India —details of extent of autonomy dependent on the ethical and social character of the people being left to be worked out by negotiations.

It seems that after writing the book it has occurred to the author that he must give his own solution of the Nagaland problem. This is why in the last chapter he suggests that some sort of Third Force should be created which will persuade the dissident Nagas to remain with India. This Third Force according to him will be some sort of a massive peace corps type of voluntary effort working with missionary zeal to transform Nagaland without changing it. "The activities of such a movement must come from among the Nagas themselves and must be outside the dispute, while the workers must be Indians who are prepared to leave their political shoes outside." There is no denying that a better understanding and a much greater social contact between the Nagas and the masses in the rest of the country are called for. But after presenting so brilliantly the recalcitrant attitude of the die hards of the undergrounds, it is not known on what basis Stracey has built his hope that such a third force will pay dividends. Completely ignoring the lawful Government of Nagaland in finding the political solution also seems to overlook the political developments in Nagaland notwithstanding that undergrounds have still a large following. But these are his conclusions and one has freedom to hold his own views!

As for the style of the book and the contribution it makes on the growing literature about Nagaland, I am all appreciation for it. The book makes an absorbing reading because of its style. Such a serious matter as the political tangle of Nagaland is presented as a historical fiction because of the style. Through a collection of anecdotes he unfolds the political drama played in Nagaland during the last 10 years. Stracey must have kept detailed notes of the events as they were taking place because practically every argument, counter argument press reaction in India and above all reactions in Nagaland have been detailed which only a minute observer could do. I do not know whether anyone has maintained a diary of events in the history of Nagaland tangle but one can easily construct one by reading Stracey's book.

—H. G. Paranjpe